Public Utilities

FORTNIGHTLY

Volume 63 No. 2 January 15, 1959

In Two Sections—Section I

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THE ECONOMIC LIABILITY TO REPLACE
By Alfred A. Ring

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The Impact of Chemical Industry on Electric-Gas Utilities
Part II.
By C. E. Wright

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Utility Problems during Inflation
By Herman L. Gruehn

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Financing Electric Utility Expansion

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FORTNIGHTLY

VOLUME 63 JANUARY 15, 1959 NUMBER 2

ARTICLES

FEATURE SECTIONS

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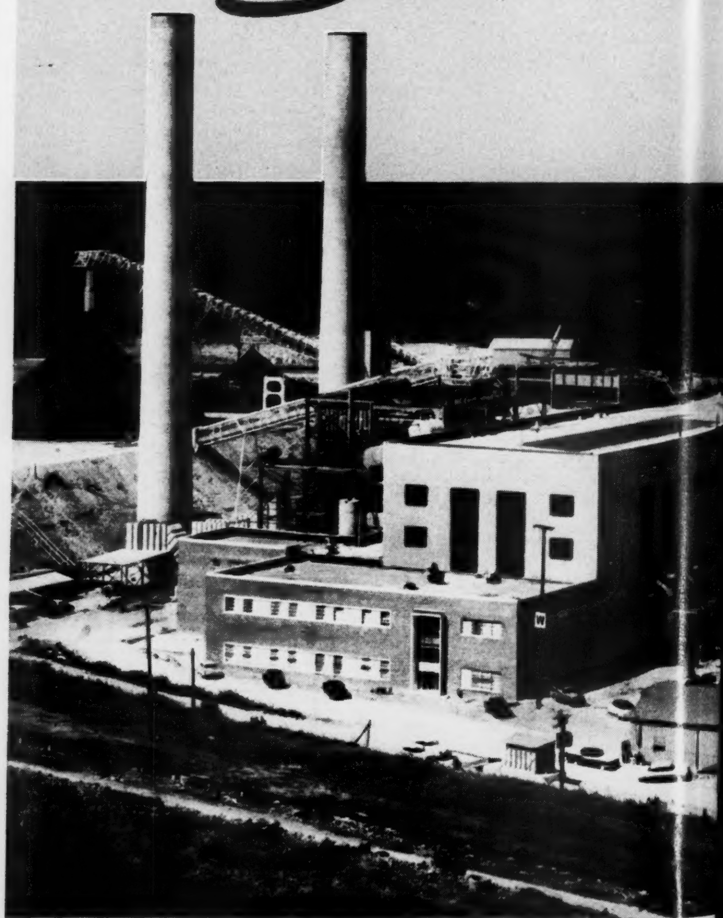
Goes into Service



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...lectric & Gas Co.'s

...ON

...A not.ble expansion of its system was made ...arly .n June by South Carolina Electric & Gas Comp.ny when it placed in service the first ...enera.ting unit at the new Silas C. McMeekin Statio.. The new unit, with a rated capacity of ...125,0..0 kw, was the first of two duplicates. No. 2 ...went .n the line in November. Gilbert Associ-...tes, I.c. are the Consulting Engineers.

Pow.er studies, conducted to determine the ...equir.ements of the rapidly growing area served ...y the South Carolina Electric & Gas System, indicated the need for new capacity in the vicinity of Columbia. It was decided therefore to locate the new McMeekin Plant on Lake Murray, 12 miles west of the city, on the site of the Saluda Hydroelectric Station where an excellent source of feed and condensing water is available.

Both generating units at the McMeekin Station are served by C-E Controlled Circulation Boilers, a cross-sectional elevation and brief description of which appear below.

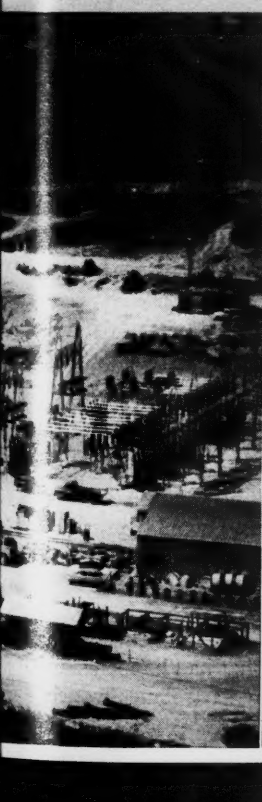
...COMBUSTION ENGINEERING

C-E

Combustion Engineering Building, 200 Madison Avenue, New York 16, N. Y.

C-194

...LL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; ...APER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS: PRESSURE VESSELS: SOIL PIPE



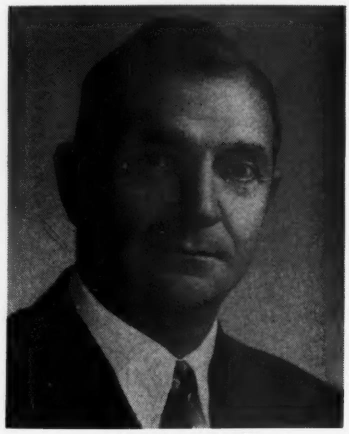
One of two duplicate C-E units now in service at the McMeekin Station. It is of the controlled circulation, radiant reheat type, with a divided furnace arrangement. The reheater is comprised of both radiant and convection surface at the top of the furnace, with radiant platens intermeshed with the forward platens of the secondary superheater. An economizer section is located below the rear superheater surface. Regenerative-type air heaters follow the economizer surface. Each unit is designed to serve a 125,000 kw turbine generator operating at a throttle pressure of 2400 psig, and with primary steam temperature of 1050F reheated to 1000F. Fuel is pulverized coal using bowl mills and tilting tangential burners.

Pages with the Editors

TRYING to explain the concept of depreciation in a way which everybody can understand, even if they do not agree with it, is a challenging task. We heard once of a rather forthright method used by the president of one of the nation's major airlines, who was trying to explain to some mechanic employees why it was necessary to worry about such matters as depreciation reserve, along with payroll demands and tax increases.

THIS president, who shall be nameless, although he probably got quite a kick out of telling the air-line employees about the depreciation in a way which they will never forget, called a meeting for that purpose. After he was introduced, the employees were startled to see him sit down and take off his shoes. The sight of the boss standing before the microphone without his shoes was enough to arouse their interest, and impress upon them what he had to say. He pointed out that the shoes were only a modestly priced pair, as such things go—which he had bought a month previous for $15. He said he thought the reasonable life expectancy of the shoes, if nothing else happened to them before they wore out altogether, might be another fourteen months.

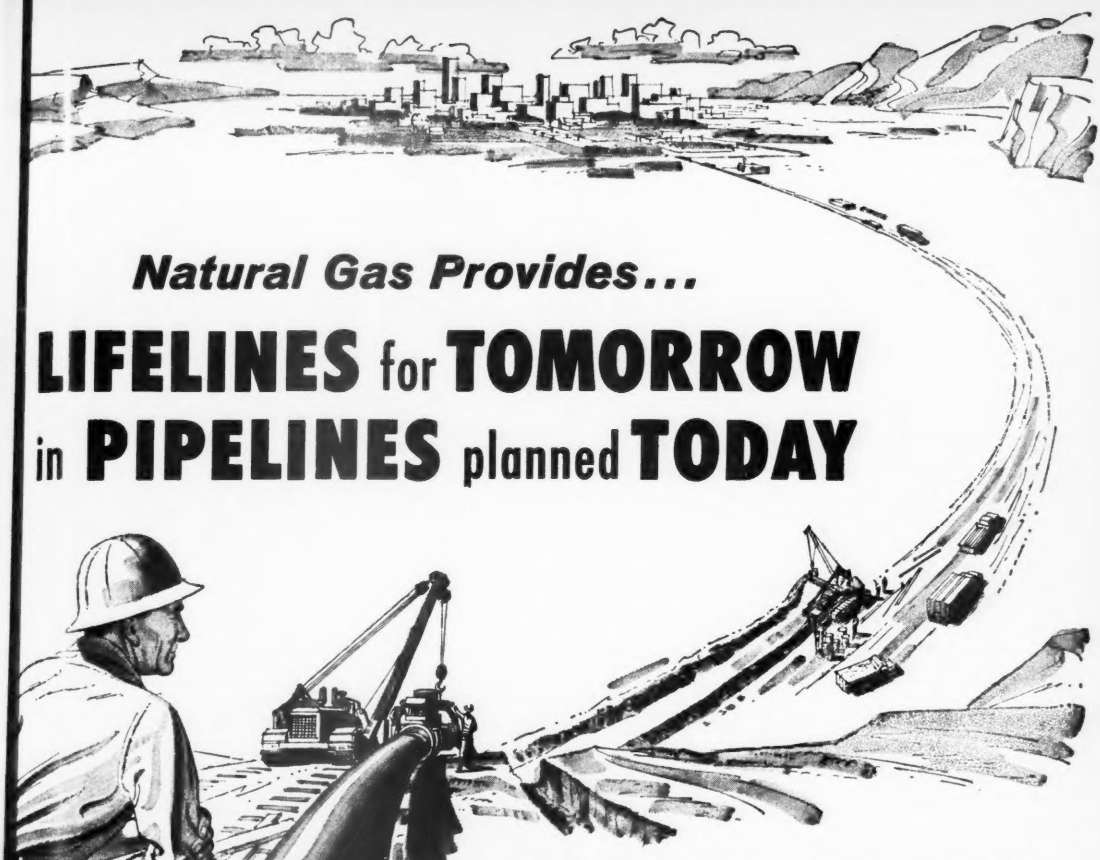
HERMAN L. GRUEHN



ALFRED A. RING

WE can see from this that the executive was setting a pattern in thrift, if nothing else. To be sure, however, that he would not have to take the price of a new pair of shoes all at once out of a single pay check, he pointed out that a wise provision would be to set a dollar aside out of each monthly pay check, so that at the end of the term, when the shoes would be theoretically worn out, he would have $15 laid aside to buy another pair. All the time he was talking the air-line president kept flipping silver dollars into his shoes to emphasize the importance of setting aside the "depreciation allowance" out of each pay check. Then he brought the point home that when the time came to buy the new pair of shoes, the way prices have been increasing, he would doubtless find that a pair of similar quality would probably cost about $25. So his "depreciation reserve" would only be sufficient to take care of two-thirds of the replacement cost. And if his other living expenses and commitments used up the rest of his pay check, "I would probably have to borrow the extra $10" to take care of the so-called replacement cost.

THEN he pointed out that this, in a miniature way, was what had happened to the airplane company. Airplanes which



Natural Gas Provides...

LIFELINES for TOMORROW in PIPELINES planned TODAY

In the next few years, the people in the West are going to have a lot of new neighbors. The western states served by El Paso Natural Gas Company and its subsidiaries are growing three times as fast as the rest of the nation.

There are good reasons for this rapid growth — climate, scenery, a dynamic economy. New businesses are starting, old businesses are expanding.

Spurring this progress are energy supplies — natural gas, liquid petroleum, water power and solid fuels. They fuel business machinery, heat homes, power mills, provide the basic essentials for the comforts of life.

Today, natural gas is the West's fastest growing source of energy. Use of natural gas is expected to rise an estimated 86 per cent in the decade ending in 1966.

It's our job to see that the West gets that gas. We are constantly searching for new reserves, developing them and then building the pipelines to deliver the gas to distributors and industries, from wells hundreds of miles away.

This effort pays off in the assurance that years in the future — even with demand growing at a record pace — the West will have the *energy supplies* essential for continued growth.

EL PASO NATURAL GAS COMPANY

...mon Stock listed on the New York Stock Exchange, Midwest Stock Exchange and Pacific Coast Stock Exchange.

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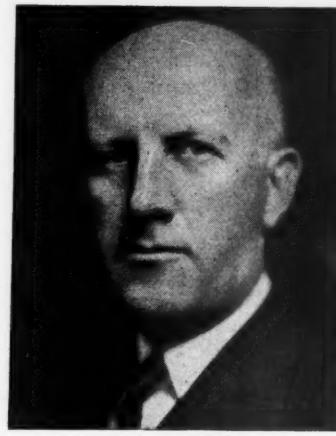
originally cost less than a million dollars, with a life expectancy of four or five years, had to be replaced with planes costing 50 to 100 per cent more than the original cost. "And we have to go out and borrow the extra money," or raise new money by issuing more stock to investors. The object lesson being completed, the airline boss threw the remaining coins among his employees and put his shoes back on. It is a safe bet that not many of them ever forgot that simple, homely demonstration of what depreciation is and how it must be provided for, on the conventional straight-line equal instalment plan.

An alternative depreciation concept is the so-called "liability to replace method," which is the subject of the leading article in this issue. This is not a new method as far as the courts and the public utility commissions are concerned. It was used with good results by expert witnesses as long as twelve years ago, and as recently as last year, in connection with a rate case hearing. But this method has not been spelled out in article form, as far as the editors are aware. Hence the timeliness of the article, entitled "The Economic Liability to Replace" by DR. ALFRED A. RING, professor of real estate and university appraiser at the University of Florida in Gainesville.

PROFESSOR RING joined the faculty of that institution as professor of real estate in 1947, and he is now professionally active as evaluation consultant in addition to full-time teaching in the College of Business Administration. PROFESSOR RING took his Bachelor, Master, and PhD degrees at New York University, where he also served in the engineering department of Westchester Lighting Company. That is a subsidiary of Consolidated Edison Company. From 1942 to 1948 he was a research associate at NYU with Dr. Herbert B. Dorau and J. Rhoads Foster, who were teaching economics at NYU at that time.

* * * *

BEGINNING on page 83 is the second of a three-part article showing how gas



C. E. WRIGHT

and electric utilities have shared in the outstanding growth of chemical processes in recent years. In Part II of this series by C. E. WRIGHT, former industrial magazine editor, now a resident of Jacksonville, Florida, the author gives us a picture of what has happened in the South Atlantic states during the recent great industrial expansion. In Part I of this series MR. WRIGHT covered the chemical industrial picture mainly for the states of Texas and Louisiana.

* * * *

THE inflationary theme is also the basis for the article which begins on page 91 by HERMAN L. GRUEHN, vice president of the Baltimore Gas & Electric Company. MR. GRUEHN was born in Baltimore and educated at the University of Pennsylvania. He has been with the Baltimore utility company (formerly known as Consolidated Gas, Electric Light & Power Company) since 1934. He became vice president in 1946. MR. GRUEHN was a member of former Governor of Maryland Lane's State Highway Advisory Council. Altogether, MR. GRUEHN has been in the utility field for twenty-five years, including service with United Gas Improvement Company.

THE next number of this magazine will be out January 29th.

The Editors

Coming IN THE NEXT ISSUE

(January 29, 1959, issue)

★

TELEPHONE SELLING—SERIOUSLY AND OTHERWISE

Telephone selling has had a mixed reaction among various large stores and merchants as well as among the telephone companies themselves. But the telephone companies are really going places with the new techniques and mass training of salesmen who take orders over the telephone. There are challenges, of course, on such things as special-sized merchandise (hats and shoes) and clothes and things which sell on sight appeal, such as food and toys. James H. Collins, who has frequently written for this publication, has made a survey from the standpoint of the "sidewalk superintendent" and what he says about the telephone industry's sudden urge to merchandise will make entertaining and provocative reading alike for both telephone and nontelephone people.

ELECTRICITY CREATES NEW FARM INDUSTRIES

This is a story which starts with a description of a secluded mountain farm in north Georgia. Thousands of hens are eating from a conveyor belt and drinking mountain spring water. Joseph W. Kling, manager of public relations for the Georgia Power Company, and Lamar T. Wansley, manager of the rural division of the Georgia Power Company, have written this joint description of an interesting experiment in developing new farm industries with electric appliances. Not only the use of power in the poultry business but for other farm purposes, such as livestock, sheep and wool, grain and hay, and dairy products, is discussed. Even small seven-acre suburban farms have possibilities when the kilowatt-hours are put to work at their full potential.

THE IMPACT OF CHEMICAL INDUSTRY ON ELECTRIC-GAS UTILITIES. PART III.

In Part I and Part II, C. E. Wright, author of business articles now resident in Jacksonville, Florida, described the tremendous expansion of the chemical industry in the southern and South Atlantic states. In this concluding instalment Mr. Wright continues the narrative with an examination of northern, middle western, and western states. There is the chemical shore of Lake Erie near the heavy steel and industrial economy of the Cleveland area. There is the coal mining area of West Virginia and Pennsylvania. And there is the heavy industrial region bound by the New York, Philadelphia, and New Jersey triangle which supplies scientific, technical, and skilled personnel for chemical operations. Company by company, as well as area by area, the author takes us over the ground of intensive chemical development and its impact on the gas and electric utilities.

☆

Also . . . ***Special financial news, digests, and interpretations of court and commission decisions, general news happenings, reviews, Washington gossip, and other features of interest to public utility regulators, companies, executives, financial experts, employees, investors, and others***

Remarkable Remarks

"There never was in the world two opinions alike."
—Montaigne

Melchior Palyi
Economist.

"The freedom from profit-and-loss considerations i a clear invitation to waste. Waste of resources is th outstanding feature of nationalized managements."

Benjamin F. Fairless
Industrialist.

"A dangerous drift toward mediocrity [is the inevi table result of our] drifting away from the idea o properly rewarding that individual who does the bes job."

W. Baumol
Professor, Princeton University.

"Abandonment of the free market economy and th bureaucratic machinery that must be set up to administe direct regulation . . . are not measures to be taken lightly."

Charles R. Sligh, Jr.
Executive vice president, National Association of Manufacturers.

"With the antibusiness forces mobilized as a nation-wide vote-getting dragnet, America's corporations can no longer evade political responsibilities with the pre-text that business and politics don't mix."

Beryl W. Sprinkel
Economist, Harris Trust & Savings Bank, Chicago.

"Those that argue for government investigation and regulation of price and wage changes would place a strait jacket on the American economy, thereby severely limiting adjustments to changing market conditions."

Ezra Taft Benson
Secretary of Agriculture.

"We believe government is in too many businesses now. We believe that government should not be in business in competition with its own tax-paying citizens. We believe in leaving to private enterprise the things that private enterprise can do and is willing to do."

John W. Gwynne
Chairman, Federal Trade Commission.

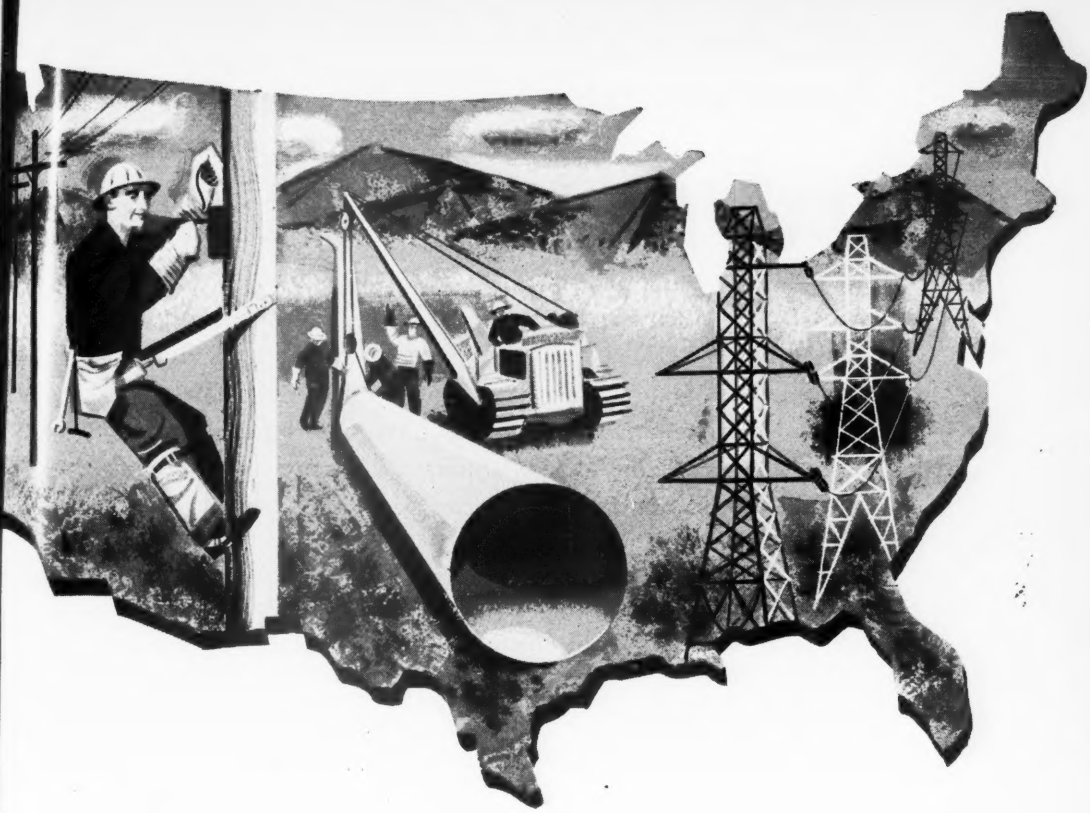
"The purpose of an investigation, whether in government, in science, or in any other field is to discover the truth. Over the years, courts and other tribunals have discovered techniques and developed facilities, many of which are not found in congressional investigation."

Leon Gavin
U. S. Representative from Pennsylvania.

"Certainly we did not build our country on subsidy programs. America was built by hard work, thrift, and frugality. Unless we change the trend I am quite certain we will end up with a bureaucratic government overlording all phases of our economic and industrial life."

Editorial Statement
The Wall Street Journal.

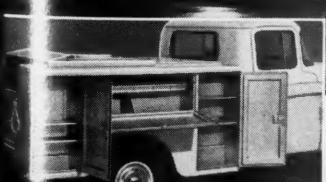
"[There is] a defect intimately associated with much current sociological belief. This is the assumption that people will naturally become upstanding citizens if they are just given pleasant surroundings, an easy life, and sufficient sociological instruction. Unhappily that is not often the case."



Has tools...will travel! Utility and other emergency servicemen swear by this Dodge V-8 Tradesman, and for good reasons. Besides pick-up load space, it has lock-up room for all tools. And with famous Dodge dependability, it has these advantages that come in handy on all service calls: 45 hp. more than Truck "C", 19 more than Truck "F" . . . shortest turning radius . . . the largest payload, load space, and brakes in the low-priced 3.

You can choose a powerful V-8 or thrifty Six, 3- or 4-speed transmission—even push-button automatic LoadFlite. See your Dodge dealer about this Tradesman, or any Dodge truck up to 49,000-lb. G.V.W. Power Giants. Find out why . . .

today, it's real smart to choose **Dodge Trucks**



A king-sized tool chest on wheels . . . that's the Dodge Tradesman's body. Tools and supplies stow neatly, where you can reach them quickly. A place for everything. All compartments lock. Available sliding roof protects pick-up load space, between body sides. Choice of two body styles.

UTILITIES
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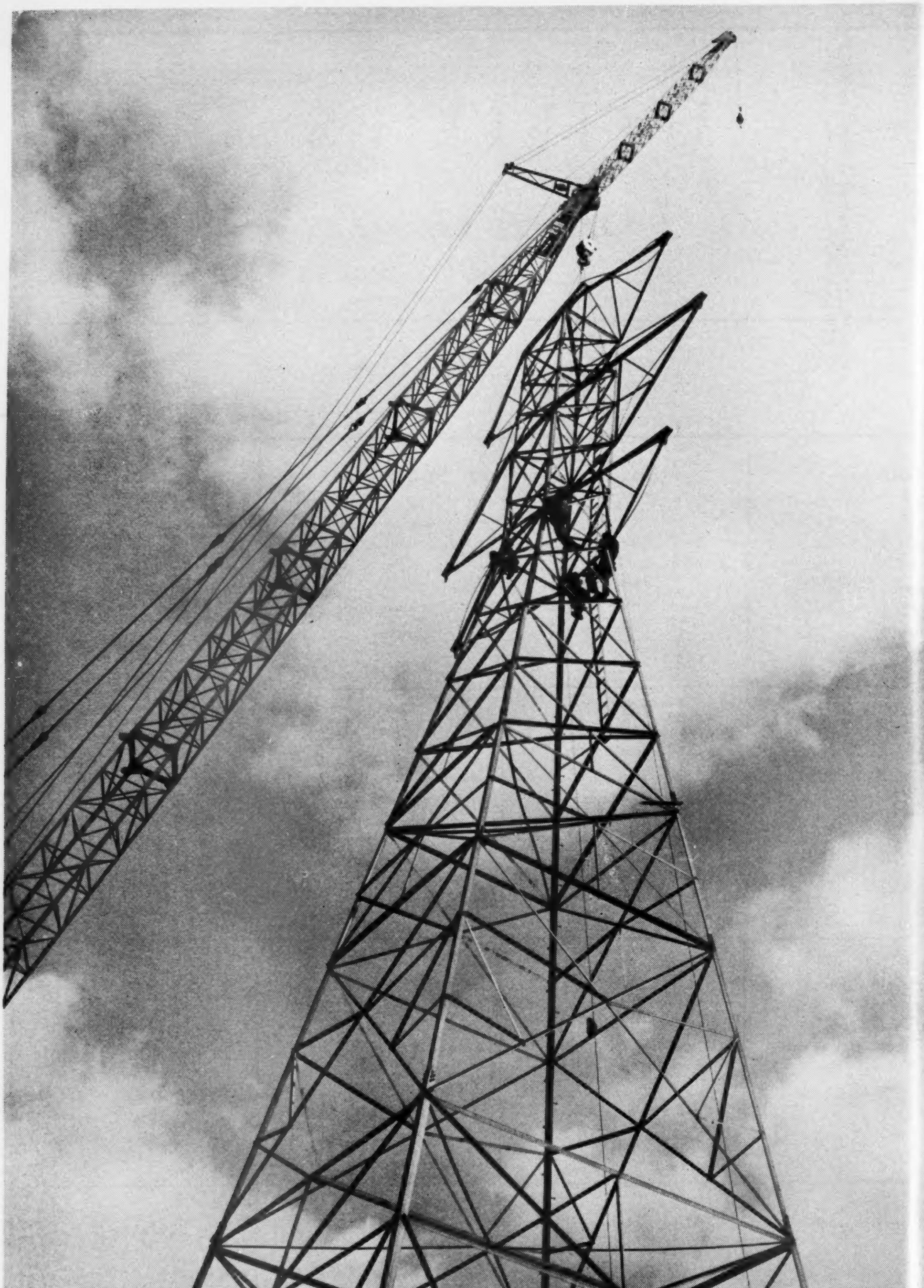
JANUARY

Thursday—15 *dison Electric Institute, ndustrial Power and Heat-g Group, begins meeting, Atlanta, Ga.*	**Friday—16** *Oklahoma Utilities Association, Accounting Section, begins meeting, Tulsa, Okla.*	**Saturday—17** *American Institute of Electrical Engineers will hold winter general meeting, New York, N. Y. Feb. 1-6.* ***Advance notice.***	**Sunday—18** *National Association of Home Builders begins convention and exposition, Chicago, Ill.*
Monday—19 *ndustrial Heating Equip-ent Association begins nnual meeting, Cleveland, Ohio.*	**Tuesday—20** *Edison Electric Institute, Prime Movers Committee, will hold meeting, Beaumont, Tex. Feb. 2-4.* ***Advance notice.***	**Wednesday—21** *Western Winter Radio-TV and Appliance Market will hold western merchandise mart, San Francisco, Cal. Feb. 2-6.* ***Advance notice.***	**Thursday—22** *New England Gas Association, Operating Division, begins meeting, Boston, Mass.*
Friday—23 *Adv[illegible]tising Association of he [illegible]est begins midwin-er [illegible]nference, San Jose, Cal.*	**Saturday—24** *American Water Works Association, Indiana Section, will hold annual meeting, French Lick, Ind. Feb. 4-6.* ***Advance notice.***	**Sunday—25** *Louisiana Telephone Association will hold annual convention, New Orleans, La. Feb. 3-5.* ***Advance notice.***	**Monday—26** *American Society of Heating and Air Conditioning Engineers begins annual meeting and exposition, Philadelphia, Pa.*
uesday—27 *Am[illegible]can Water Works As[illegible]ation, New York Sec[illegible]n, begins midwinter un[illegible]on meeting, New York, N. Y.*	**Wednesday—28** *Midwest Welding Conference begins, Chicago, Ill.*	**Thursday—29** *American Gas Association begins home service workshop, New Orleans, La.*	**Friday—30** *Public Utilities Advertising Association ends two-day regional meeting, Portland, Ore.*



Hard to Top This!

Although this 175-foot transmission tower of the Ohio Edison Company is prefabricated, it takes a 190-foot crane and the skillful finesse of four deft workmen to bolt it securely in place. Another link in a 138,000-volt line that stretches 11.67 miles.

Public Utilities
FORTNIGHTLY

VOLUME 63 JANUARY 15, 1959 NUMBER 2

A New Concept of Measuring Accrued Depreciation

The Economic Liability To Replace

By ALFRED A. RING*

The "liability to replace" method measures accrued depreciation as an economic fact whether provision is made for depreciation or not. The physical or technological impairment of an asset, as measured by the equal percentage or straight-line method, is converted into loss of value by ascertaining the present worth of the dollar liability that must be met at time of replacement. Shown in practice to be virtually as accurate as lengthy engineering or "observed" study methods of experts.

PUBLIC utility and related enterprises whose rates are controlled by regulatory agencies to yield an income not in excess of a prescribed rate of return on net capital investment are vitally concerned with the economic problem of measuring accurately the amount of accrued depreciation. Overestimating accrued depreciation reduces the amount of net investment capital on which the rate of return is based and deprives investors of their just and fair return as sanctioned by law.

The simplicity, popularity, and widespread use of the "straight-line" method of depreciation accounting have influenced regulatory agencies, both state and federal, to consider investment losses resulting from wear, tear, and obsolescence on the basis of book or straight-line accounting accruals. This seems contrary to

*Professor of real estate and university appraiser, University of Florida, Gainesville, Florida. For additional personal note, see "Pages with the Editors."

economic principles. Depreciation is a loss in value due to any cause. This loss in value may properly be called a measure of "negative" worth of the invested capital. Remaining, positive, or *present* value of a capital good plus accrued *negative* worth (*depreciation*) must equal at a given time the cost of the capital investment under original, historical, or replacement value concepts that guide regulatory agencies.

DEPRECIATION in essence is a decline in value which represents a current liability to replace a capital good at the end of its estimated remaining service life. Since the necessity to replace the investment is deferred for years into the future, economic principles warrant that this future obligation to replace be converted or discounted to a present liability or measure of negative worth. The same economic law that sanctions determination of value in terms of "present worth of future rights to income" applies to measurements of depreciation or *negative* value in terms of the present (negative) worth of future liabilities to replace a depreciable investment.

Assuming 6 per cent as the appropriate rate of capitalization it can be demonstrated that the present worth of a sum of $10,000 to be received twenty years hence is only $3,118 today ($10,000 times .3118 —present worth of $1). The economic yardstick applied to future income seems applicable with equal logic to future liabilities. If a $10,000 capital amount is due to be replaced twenty years hence, the present liability to replace (accrued depreciation) is not $10,000 but rather the present (negative) worth of this liability which at 6 per cent is $10,000 times .3118 or $3,118. Although the procedure to measure future liabilities by the discounting method, as demonstrated above, seems logical, this procedure is not customarily in use by accountants nor is the discounting of future liabilities generally sanctioned by regulatory agencies for rate-making purposes.

The theoretical methods of measuring accrued depreciation currently in recommended practice are the following:

1. Straight-line Method.
2. Sinking-fund or Haskold Method.
3. Annuity or Inwood Method.

TO illustrate the relative measure of accrued depreciation obtained under these accounting methods, it is assumed that a depreciable fixed asset with a total economic life of fifty years has reached an effective age of twenty-five years and that the replacement cost new is $10,000. The accrued depreciation—at property mid-life—under the prevailing accounting methods compares as shown in Table 1, page 75.

The variations in amount and per cent of accrued depreciation as shown in Table 1 are significant. The straight-line method records results 155 per cent as great as those secured under the 3 per cent sinking-fund method and 264 per cent greater than those indicated under the annuity method of depreciation accounting. Such wide variations are a cause for serious consideration as to which method conforms to economic behavior of depreciable goods and services.

In any discussion of accrued depreciation, a distinction must be made at the outset between depreciation as an

"amount" (book depreciation) and depreciation as a "fact" (actual) based on factual study and field analysis of the causes of depreciation and their economic effects on the specific assets under value study. The wide variations in book provision for accrued depreciation under selected methods of accounting were shown in Table 1. Depreciation as a *fact* occurs independently of provisions that may or may not be made to account for anticipated value losses. Whether book depreciation is inadvertently overprovided or underprovided, as a result of a selected accounting system, should in no way affect the fair rate of return sanctioned by law and as applied to the fair value of the assets devoted to public service.

To ascertain the applicable rate base (fair value) it is essential that accrued depreciation as a "fact" be measured accurately either by the lengthy and costly "observed" or engineering method or by the equally sound "liability to replace" method under which accrued depreciation is effectively measured as demonstrated below. Under the "observed" method of measuring accrued depreciation it is necessary that an economic (useful) life be assigned to each major class of asset and that the loss of value due to physical, functional, and economic causes be ascertained by field inspection and careful observation. Under the "liability to replace" method the physical or technological impairment of an asset, as measured by the equal percentage or straight-line method, is converted into a loss of value by ascertaining the *present worth* of the dollar liability that must be met at time of replacement; that is, when the asset reaches the end of its economic life.

The accuracy of the "liability to replace" method was effectively demonstrated some years ago in a depreciation analysis of the assets of one of the largest utility companies in the United States. In this study the findings came within a very close range of the dollar depreciation losses found independently by the detailed and lengthy engineering or "observed" study completed by qualified technical experts under close supervision of the public utilities commission of the state concerned.

In applying the "liability to replace" method as a measure of accrued depreciation, the effective or economic life of each major asset is determined. For example, transformers, ten years; utility poles, twelve years; cables, thirty years; buildings, fifty years; power dams, one

TABLE 1

Method	*Age*	*Cost New*	*Annual Provision*	*Cumulative Factor*	*Amount Depreciation*	*Per Cent Depreciation*
Straight line	25	$10,000	$200.00	$25.00	$5,000	50.0
Sinking fund 3% .	25	10,000	88.65[1]	36.46[2]	3,232	32.3
Annuity 6%	25	10,000	34.44[3]	54.86[4]	1,889	18.9

[1] Based on sinking-fund factor at 3 per cent for fifty years.
[2] Based on amount of 1 per period at 3 per cent for twenty-five years.
[3] Based on annuity of 1 per period at 6 per cent for fifty years.
[4] Based on amount of 1 per period at 6 per cent for twenty-five years.

hundred years, etc. For each of these assets a technological decline in service life is accepted as following a straight-line or equal percentage pattern. The technological loss indicated at a given time or age of the asset, whether accounted for by a reserve for depreciation or not, is then converted into an economic measure or present worth of the liability to replace the asset at the end of its service life.

Assuming a given asset has an economic life of fifty years and a cost new of $1,000 at mid-life this asset has *technologically* accumulated 50 per cent of its cost or $500. Assuming further that through proper maintenance the usefulness of the investment to render service is relatively unimpaired, the *economic* or value loss is not 50 per cent of $1,000, or $500, as shown on the books of account under the straight-line method of accrual but rather the present worth of the liability to replace $500 worth of investment twenty-five years from today. This liability, assuming that 6 per cent is the correct rate of return or discount, is $500 times .233 (present worth of $1 at 6 per cent due twenty-five years from date) or $116.50. It is this amount that must be recognized as the economic measure of accrued depreciation and not $500 whether shown or not by bookkeeping entry.

Proof of the accuracy of this discounting method can be demonstrated mathematically. A sum of $116.50 set aside to accumulate at compound interest at 6 per cent for a period of twenty-five years will equal $116.50 x 4.2918 (future worth of 1 at 6 per cent compound interest) or $500, the amount indicated by the technological measure at mid-life period of the asset.

Upon date of purchase or date of construction of a given property the price paid or the dollar costs incurred reflect the quantity and quality of the asset acquired. The greater the anticipated utility and the longer the anticipated service life of the capital good the greater is the warranted amount that reasonably may be sacrificed as a cost of acquisition or construction. The warranted acquisition price therefore reflects the condition new of a given asset and discounts existing or accrued depreciation as of the date of purchase.

The purchaser of a capital good, in making provision for its replacement, is thus concerned chiefly with anticipated or future depreciation which, as demonstrated, in essence is a liability to replace the depreciable asset at the end of its estimated service life. The procedure followed in the conversion of the technological or arithmetic percentage loss in serviceability into an economic *measure* of negative worth is illustrated in Table 2 and is based on an investment life of fifty years and a liability or discount rate of 6 per cent.

Column 1 in Table 2 indicates the annual dollar liability based on arithmetic straight-line provision at 2 per cent per year for each of the fifty years of investment life. Column 2 shows prior year straight-line reserve accumulation. Columns 1 and 2 total in any given year the accumulated arithmetic dollar loss under "straight-line" accounting. Column 3 presents the economic conversion factor based on the present worth of $1 at 6 per cent. Because at the end of the first year, of a 50-year-life property, the liability to replace the asset is forty-nine years re-

PROCEDURE FOR THE CONVERSION OF THE ARITHMETIC STRAIGHT LINE INTO
AN ECONOMIC MEASURE OF NEGATIVE VALUE - DEPRECIATION

Based on the Negative Worth of the Liability to Replace at 6 Percent
An Investment of $1,000 Over a Period of 50 Years

	(1)	(2)	(3)	(4)	(5) Cols. 1x3	(6)	(7) Cols. 2x4	(8)	(9) Cols. 6 + 8
	Straight Line Base at 2 Percent for 50 Years		Economic Conversion Factor Present Worth of $1 at 6%		Economic Liability to Replace				
					Liability Increment for Current Year		Liability Increment for Prior Years		
Year	Annual Amount	Prior Years Accumulation	Annual Factor	Factor Increment over Prior Year	Annual	Cumulative	Annual	Cumulative	Total
1	$20.00	-	.05754566	-	1.15	1.15	-	-	1.15
2	20.00	20.00	.06099840	.00345274	1.22	2.37	.07	.07	2.44
3	20.00	40.00	.06465831	.00365991	1.29	3.66	.15	.22	3.88
4	20.00	60.00	.06853781	.00387950	1.37	5.03	.23	.45	5.48
5	20.00	80.00	.07265007	.00411226	1.45	6.48	.33	.78	7.26
6	20.00	100.00	.07700908	.00435901	1.54	8.02	.45	1.23	9.25
7	20.00	120.00	.08162962	.00462054	1.63	9.65	.55	1.78	11.43
8	20.00	140.00	.08652740	.00489778	1.73	11.38	.69	2.47	13.85
9	20.00	160.00	.09171905	.00519165	1.83	13.21	.83	3.30	16.51
10	20.00	180.00	.09722219	.00550314	1.94	15.15	.99	4.29	19.44
11	20.00	200.00	.10305552	.00583333	2.06	17.21	1.17	5.46	22.67
12	20.00	220.00	.10923885	.00618333	2.18	19.39	1.36	6.82	26.21
13	20.00	240.00	.11579318	.00655433	2.32	21.71	1.57	8.39	30.10
14	20.00	260.00	.12274077	.00694759	2.45	24.16	1.81	10.20	34.36
15	20.00	280.00	.13010522	.00736445	2.60	26.76	2.06	12.26	39.02
16	20.00	300.00	.13791153	.00780631	2.76	29.52	2.34	14.60	44.12
17	20.00	320.00	.14618622	.00827469	2.92	32.44	2.65	17.25	49.69
18	20.00	340.00	.15495740	.00877118	3.10	35.54	2.98	20.23	55.77
19	20.00	360.00	.16425484	.00929744	3.29	38.83	3.35	23.58	62.41
20	20.00	380.00	.17411013	.00985529	3.48	42.31	3.75	27.33	69.64
21	20.00	400.00	.18455674	.01044661	3.69	46.00	4.18	31.51	77.51
22	20.00	420.00	.19563014	.01107340	3.91	49.91	4.65	36.16	86.07
23	20.00	440.00	.20736795	.01173781	4.15	54.06	5.16	41.32	95.38
24	20.00	460.00	.21981003	.01244208	4.40	58.46	5.72	47.04	105.50
25	20.00	480.00	.23299863	.01318860	4.66	63.12	6.33	53.37	116.49
26	20.00	500.00	.24697855	.01397992	4.94	68.06	6.99	60.36	128.42
27	20.00	520.00	.26179726	.01481871	5.24	73.30	7.71	68.07	141.37
28	20.00	540.00	.27750510	.01570784	5.55	78.85	8.48	76.55	155.40
29	20.00	560.00	.29415540	.01665030	5.88	84.73	9.32	85.87	170.60
30	20.00	580.00	.31180473	.01764933	6.24	90.97	10.24	96.11	187.08
31	20.00	600.00	.33051301	.01870828	6.61	97.58	11.22	107.33	204.91
32	20.00	620.00	.35034379	.01983078	7.01	104.59	12.30	119.63	224.22
33	20.00	640.00	.37136442	.02102063	7.43	112.02	13.45	133.08	245.10
34	20.00	660.00	.39364628	.02228186	7.87	119.89	14.71	147.79	267.68
35	20.00	680.00	.41726506	.02361878	8.35	128.24	16.06	163.85	292.09
36	20.00	700.00	.44230096	.02503590	8.85	137.09	17.53	181.38	318.47
37	20.00	720.00	.46883902	.02653806	9.38	146.47	19.11	200.49	346.96
38	20.00	740.00	.49696936	.02813034	9.94	156.41	20.82	221.31	377.72
39	20.00	760.00	.52678753	.02981817	10.54	166.95	22.66	243.97	410.92
40	20.00	780.00	.55839478	.03160725	11.17	178.12	24.65	268.62	446.74
41	20.00	800.00	.59189846	.03350368	11.84	189.96	26.80	295.42	485.38
42	20.00	820.00	.62741237	.03551391	12.55	202.51	29.12	324.54	527.05
43	20.00	840.00	.66505711	.03764474	13.30	215.81	31.62	356.16	571.97
44	20.00	860.00	.70496054	.03990343	14.10	229.91	34.32	390.48	620.39
45	20.00	880.00	.74725817	.04229763	14.95	244.86	37.22	427.70	672.56
46	20.00	900.00	.79209366	.04483549	15.84	260.70	40.35	468.05	728.75
47	20.00	920.00	.83961928	.04752562	16.79	277.49	43.72	511.77	789.26
48	20.00	940.00	.88999644	.05037716	17.80	295.29	47.35	559.12	854.41
49	20.00	960.00	.94339623	.05339979	18.87	314.16	51.26	610.38	924.54
50	20.00	980.00	1.00000000	.05660377	20.00	334.16	55.47	665.85	1,000.00

TABLE 3

SHORT-CUT PROCEDURE FOR THE CONVERSION OF THE ARITHMETIC STRAIGHT LINE INTO AN ECONOMIC MEASURE OF NEGATIVE VALUE—DEPRECIATION*

Year	*Cumulative Accrual at 2% Per Year*	*Economic Conversion Factor at 6%*	*Negative Value Of Accrued Depreciation*
1	$ 20	.05754566	$ 1.15
2	40	.06099840	2.44
3	60	.06465731	3.88
4	80	.06853781	5.48
5	100	.07265007	7.26
6	120	.07700908	9.25
7	140	.08162962	11.43
8	160	.08652740	13.85
9	180	.09171905	16.51
10	200	.09722219	19.44
11	220	.10305552	22.67
12	240	.10923885	26.21
13	260	.11579318	30.10
14	280	.12274077	34.36
15	300	.13010522	39.02
16	320	.13791153	44.12
17	340	.14618622	49.69
18	360	.15495740	55.77
19	380	.16425484	62.41
20	400	.17411013	69.64
21	420	.18455674	77.51
22	440	.19563014	86.07
23	460	.20736795	95.38
24	480	.21981003	105.50
25	500	.23299863	116.49
26	520	.24697855	128.42
27	540	.26179726	141.37
28	560	.27750510	155.40
29	580	.29415540	170.60
30	600	.31180473	187.08
31	620	.33051301	204.91
32	640	.35034379	224.22
33	660	.37136442	245.10
34	680	.39364628	267.68
35	700	.41726506	292.09
36	720	.44230096	318.47
37	740	.46883902	346.96
38	760	.49696936	377.72
39	780	.52678753	410.92
40	800	.55839478	446.74
41	820	.59189846	485.38
42	840	.62741237	527.05
43	860	.66505711	571.97
44	880	.70496054	620.39
45	900	.74725817	672.56
46	920	.79209366	728.75
47	940	.83961928	789.26
48	960	.88999644	854.41
49	980	.94339623	924.54
50	1,000	1.00000000	1,000.00

*Based on the negative worth of liability to replace at 6 per cent on investment of $1,000 over a period of fifty years.

moved, the first factor shown in Column 3 is derived by the present worth formula

$$V^n = \frac{1}{(1+i)^n} \text{ or } V^{49} = \frac{1}{(1+.06)^{49}} = .05754566.$$

At the end of the second year of service life the liability to replace the asset is forty-eight years removed and the conversion factor as shown reflects the increased liability. At the end of the economic life, fifty years for purposes of this illustration, the liability to replace has fully accrued and the economic conversion factor is indicated as 1. The conversion factor as shown in Column 3 is applied to the arithmetic percentage loss noted in Column 1 and the annual and cumulative liability upon conversion into an economic value loss is noted in Columns 5 and 6 of Table 2.

Column 4 shows the present worth factor increment over the prior year factor. This column is used to show conversion of the accumulated arithmetic amount of prior years, as shown in Column 2, to the present worth liability as indicated on an annual and cumulative basis in Columns 7 and 8. Column 9 shows for any year the current total economic liability to replace the depreciated portion of the asset at the end of its investment life.

TABLE 2 has been prepared to show in detail the component parts and steps essential to a demonstration of the economic conversion theory under the liability to replace method of accounting for accrued depreciation. In practice the conversion of straight-line bookkeeping entries into a measure of negative worth or liability to replace can be simplified as shown in Table 3. Here the cumulative straight-line accruals for replacement are directly applied to the cumulative economic conversion factor to yield the negative worth or present dollar liability to replace the expired portion of the asset at the end of its remaining economic life. The results shown in Column 3 of Table 3 are identical with the results recorded in Column 9 of Table 2.

It is recognized that rates of return or capitalization vary with types of investment, and geographic risks of location and capital employment. Where the liability to replace an investment is measured by interest or discount rates of lesser

TABLE 4

Comparative amount and percentage depreciation at mid-life cycle for a power dam of 100-year service life under selected methods of accrued depreciation:

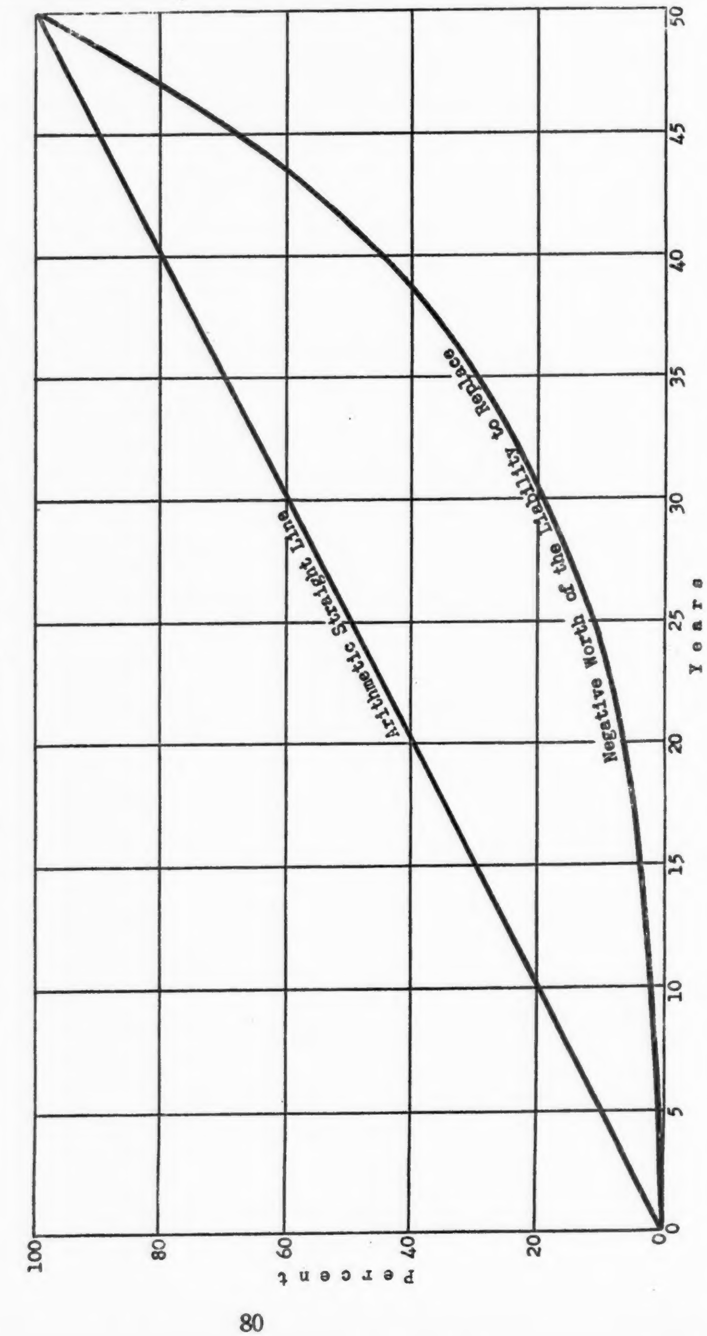
Method	*Age*	*Cost New*	*Annual Provision*	*Cumulative Factor*	*Depreciation Amount*	*Depreciation Per Cent*
Straight line	50	$100,000	$1,000.00	$ 50.00	$50,000	50.0
3% Sinking fund ..	50	100,000	164.67[1]	112.80[2]	18,575	18.6
6% Annuity	50	100,000	17.74[3]	290.34[4]	5,151	5.2
6% Liability to replace	50	100,000	—	—	2,714[5]	2.7

[1] Based on sinking-fund factor at 3 per cent for one hundred years.
[2] Based on amount of 1 per period at 3 per cent for fifty years.
[3] Based on annuity sinking fund at 6 per cent for one hundred years.
[4] Based on amount of 1 per period at 6 per cent for fifty years.
[5] Liability conversion factor (present worth) at 6 per cent for fifty years.

CHART I

COMPARATIVE RATE OF DEPRECIATION ACCRUAL AS REFLECTED BY THE ARITHMETIC STRAIGHT LINE AND THE ECONOMIC MEASURE OF NEGATIVE VALUE

Assuming an Investment of $1,000 with a Useful Life of 50 Years and Conversion of the Arithmetic Straight Line to Present Worth at Six Percent



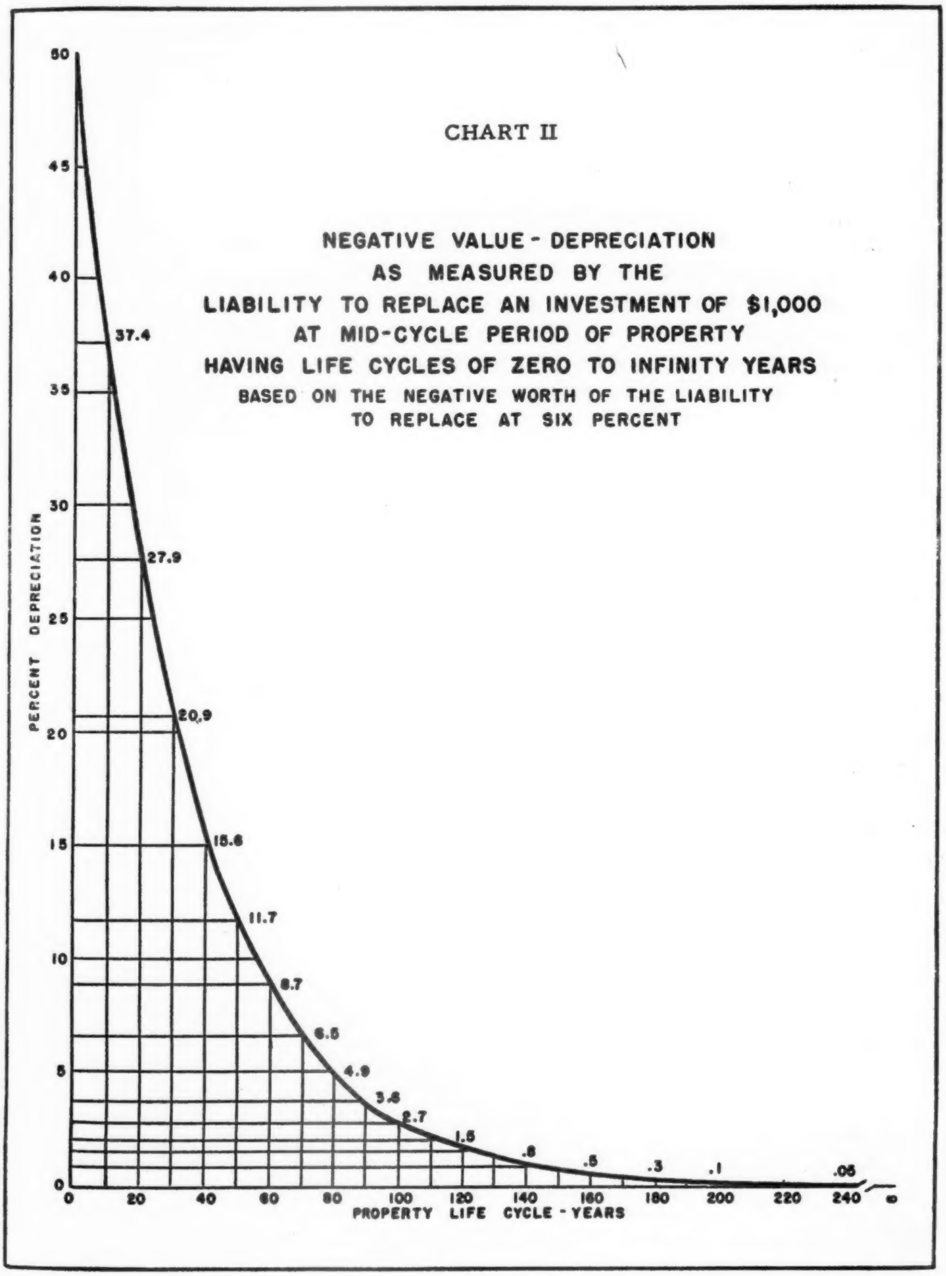


CHART II
NEGATIVE VALUE - DEPRECIATION
AS MEASURED BY THE
LIABILITY TO REPLACE AN INVESTMENT OF $1,000
AT MID-CYCLE PERIOD OF PROPERTY
HAVING LIFE CYCLES OF ZERO TO INFINITY YEARS
BASED ON THE NEGATIVE WORTH OF THE LIABILITY
TO REPLACE AT SIX PERCENT
PERCENT DEPRECIATION
0
5
10
15
20
25
30
35
40
45
50
37.4
27.9
20.9
15.6
11.7
8.7
6.5
4.9
3.6
2.7
1.5
.8
.5
.3
.1
.05
0
20
40
60
80
100
120
140
160
180
200
220
240
∞
PROPERTY LIFE CYCLE - YEARS

or greater per cent as used in the illustration above such must be used as professional discretion dictates. The procedure, however, as demonstrated does not change, and the amount derived will vary as different economic life spans or discount rates are applied.

THE significant difference between the comparative rates of depreciation accrual as reflected by the arithmetic straight-line or bookkeeping method of accrual on the one hand and the economic measure of effective negative (depreciated) value on the other is shown graphically in Chart I. In mid-life of an investment, as presented in Chart I, the economic effect of depreciation is 11.6 per cent as compared with 50 per cent under straight-line or arithmetic accounting.

The longer the total economic life of a fixed asset, the more important and significant becomes the need for selection of the appropriate method of accrued depreciation. This is illustrated graphically for the liability to replace method in Chart II. At mid-life of a 100-year property the liability method indicates an accrued negative worth of only 2.7 per cent as compared with 50 per cent under the technological or straight-line method of accounting. At mid-cycle of a 200-year-life property the economic effect of accrued depreciation is one-tenth of one per cent as compared again with 50 per cent under the straight-line method.

To compare the economic impact of accrued depreciation under selected methods of depreciation accrual for a power dam with an estimated service life of one hundred years at mid-cycle life, Table 4, page 79, is presented.

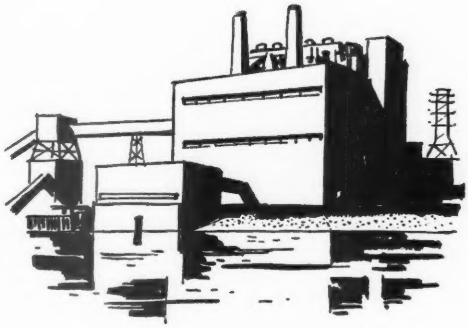
ATTENTION is called to the fact that no annual provision is shown in Table 4 under the liability to replace method. This method measures accrued depreciation as an "economic fact" whether provision is made for depreciation or not. The amount of depreciation shown was derived by discounting to present worth the straight-line—technological—loss of $50,000 at mid-life cycle by the discounting factor at 6 per cent or .0542883618.

The difference in depreciation accrual as graphically shown in Charts I and II is of such magnitude, that employment of the one or the other method of depreciation accounting may mean the difference between receivership and a fair rate of earning on the fair value of the assets employed in the operation of a utility.

It is recognized, that acceptance of the liability to replace method as a means to measure accrued depreciation would necessitate corresponding adjustment of estimates of costs to render utility service as reflected by adequate reserves for depreciation. It is not intended to imply that depreciation as a *fact* and book reserves for accrued depreciation in *amount* be measured or provided for by different economic standards. A reserve for depreciation, however, does include provisions for estimated future maintenance and repairs and the size of the reserve must essentially be based on engineering estimates and operational policy.

For rate determination the liability to replace method of measuring accrued depreciation, as demonstrated above, has a firm economic base in theory and practice and its broad adoption is strongly recommended in the interest of the investing public and utility customers.

The Impact of Chemical Industry On Electric-Gas Utilities . . . Part II



By C. E. WRIGHT*

In Part I of this article, an illuminating picture was painted of the vast chemical industrial complex that dominates the states of Texas and Louisiana. Now we tour the South Atlantic states where the story of one of the greatest industrial expansions the nation has witnessed in years is unfolded. The chemical industry, hand in hand with the resourcefulness of electric and gas utilities in providing ample power, has literally boomed the South!

NOWHERE else in the South has the rise of chemical processing industries been so spectacular as in Texas or Louisiana, but nevertheless there have been significant developments in most of the southern states. The chemical industry has been so important to Virginia, for example, that the Virginia Electric & Power Company a few years ago put out a special lengthy booklet report, titled "The Chemical Industry Grows with Virginia." In northwest Florida, where major expansion has taken place in the past years, sales by Gulf Power Company to chemical and allied industries in kilowatt-hours have increased 525 per cent from 1952 through 1957, with further gains impending. Alabama has greatly benefited from the development of the Warrior-Tombigbee-Mobile waterway and the Coosa and Tallapoosa rivers in which the Alabama Power Company has been an important factor. Tennessee also has enjoyed major chemical plant expansion, but the power benefits have accrued to the TVA and not to the investor-owned, business-managed electric companies, a sore point with the private power industry, as is well-known.

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These are merely a few of the high points in chemical expansion. There are many others. It is interesting to note that Mississippi, which has been emerging in recent years from an agricultural economy to one in which industry assumes a larger rôle, is twentieth in the list of states that have benefited from chemical industry expansion in the survey of the Manufacturing Chemists Association for 1957-59. R. Baxter Wilson, president of the Mississippi Power & Light Company, points to the large effect this expansion has had on the company's sales of power. He says 31.5 per cent of kilowatt-hour sales are to chemical and fertilizer and cottonseed products plants compared with 17 per cent five years ago. These plants account for 15.5 per cent of all commercial sales. The company's largest industrial user is a chemical plant producing ammonia, ammonia nitrate, and nitric acid. Load requirements of this plant are 17,000 kilowatts and expansion plans are under way. In the company's service area are 43 processors of animal and vegetable oils, 12 makers of fertilizers, seven manufacturers of miscellaneous chemicals and preparations, two pharmaceutical manufacturers, and nine manufacturers of inorganic chemicals, including such well-known names as Wyandotte Chemicals Corporation and Spencer Chemical Company. Moreover, the western border of the company's territory is the Mississippi river, where further major chemical plant growth is expected.

Chemicals Rival Steel In Alabama

NEXT door to Mississippi is Alabama, where chemicals are now vying with steel as that state's leading industrial producer. Birmingham's Committee of 100 issued a special booklet last year, titled "Alabama's Chemical Industry," which listed 188 chemical manufacturers with a total 1957 output of more than $250 million, a gain of 483.9 per cent over 1939 and 211.6 per cent over 1947. Almost every company of national renown in the chemical field is represented in Alabama, including such names as Monsanto, Olin Mathieson, Aluminum Co. of America, Allied Chemical, Reichhold, du Pont, Hercules Powder, American Cyanamid, Diamond Alkali, to mention only a few.

THE Alabama Power Company has had an important rôle in the chemical industrialization of Alabama, not only in a long-range power expansion program, including hydroelectric development, but also in inducing chemical companies to locate there. Discovery of a salt dome several years ago under what was then the little town of McIntosh, which has since had a mushroom growth, sparked the chemical construction boom in Alabama. The Mathieson Alabama Chemical Corporation began building a $10 million alkali plant in 1951, using salt for its raw material and supplying chlorine and caustic soda to other companies which quickly followed to utilize these in their own processing. Among these was a $24 million plant built by Courtaulds, British viscose rayon manufacturer. In 1955, at the peak of its chemical plant building boom, Alabama stood eleventh in the nation in chemical expansion. Tremendous expansion of pulp and paper manufacture has proceeded along with the strictly chemical products. The Alabama boom is a story in itself not unlike that of Texas and Louisiana, and the end is not yet.

Discovery of oil at Citronelle, some 30 miles northwest of Mobile, by Gulf Oil could, for one thing, eventually have a marked effect on the chemical industry of Alabama.

PLENTY of electric power and natural gas, abundance of water for navigation and processing, the presence of large supplies of salt and other favorable factors presage a large future development of the chemical industry in the state. Alabama Power Company is preparing for just such an event with a river development program that will not only greatly increase its power capacity but make many more industrial sites available. One of the most ambitious projects now under way is the Lewis Smith dam on the Warrior river. It will be 300 feet high, 2,200 feet long, and will create a deep lake with 500 miles of shore line. Its powerhouse will have an 80,000-kilowatt generator initially, with another of the same size to be installed later. Besides power generation, the project will create a large recreational area, supply the city of Birmingham with industrial water, speed up the river flow so that fresh water will push the salt water farther downstream and thus make more fresh-water industrial sites available. Thus Alabama will be geared for the further chemical industry expansion it confidently expects.

W. Cooper Green, vice president in charge of industrial development, comments that the company's Coosa river program will speed development of that valley by providing some measure of flood control and making navigation possible when locks are constructed by the federal government.

SOME of the power generated by the Alabama Power Company is shared with its sister company in the southern group, Georgia Power Company, in whose area chemical expansion has also been outstanding. Georgia ranks twenty-sixth in the country in chemical manufacturing and seventeenth in the MCA construction survey. Combined total of chemical plant construction expenditures in Georgia in the three-year survey period 1957-59 is nearly $62 million, of which close to $45 million was expended in 1957. Georgia's chemical industry ranks high in consumption of electric power, according to Georgia Power Company, which has been very active in the development of hydroelectric generating plants, plus steam plants, in its service area.

Twenty-one hydro plants had a total

¶ "THE Duke Power Company, whose service area includes most of North Carolina and South Carolina, has benefited to a marked degree from the growth of chemical plants, of which a majority is in the Charlotte, North Carolina, area. 'The service area of the two states in which we deliver power has, in the past ten years, had an exceptional growth in the development of industrial plants, many of which are manufacturers or processors of chemicals or allied products,' commented Channing B. Brown, manager of the industrial power department of Duke Power. . . . Duke Power counts 35 chemical-processing plants in its area with contract demands of upward of 100 kilowatts."

capacity of 360,930 kilowatts as of recent date.

Almost every branch of chemical manufacture is represented among Georgia's fast-expanding industries. Some of the best-known companies with Georgia plants are American Cyanamid, Virginia-Carolina, Allied Chemical, Olin Mathieson, Hercules Powder, International Latex, Chicopee Manufacturing Company, Armstrong Cork, Armour, du Pont, Rayonier, which is only skimming the surface of the diversified representation.

Chemicals Invade Florida

JUST below the Alabama-Georgia border is northwest Florida, which has undergone a surprisingly large development in chemical processing in the past few years. Although Florida has not long been ranked among the country's industrial states, its chemical plant expenditures for 1958-59, totaling more than $60 million, put it in seventh place in the nation in the MCA survey. In 1957 a total of $84,550,000 was spent on ten construction projects in the chemical field. Thus the combined total for the three-year period 1957-59 is $144,675,000. Florida now ranks eighteenth in the nation in chemical production. Most surprising is that in 1956-57 Florida was fourth in construction of new chemical processing facilities.

Chemstrand Corporation's fully integrated nylon plant near Pensacola is the largest industrial plant of any type in the state. Total cost, including a recent expansion program, has been upward of $100 million. American Cyanamid Company's $27 million plant for making acrylic fiber is in the same area, as is the new multimillion-dollar plant of the Escambia Chemical Corporation. The Pensacola area has had some chemical manufacturing since 1916, but the giant Chemstrand plant was what really put the area on the map, chemically speaking.

WHAT this development has meant to the Gulf Power Company is illustrated by the company's figures on sales to chemical and allied industries. In 1952 such sales totaled 27,682,520 kilowatt-hours. In two years this had more than tripled—to 95,006,320 kilowatt-hours in 1954. By 1956 such sales were 168,952,130 kilowatt-hours, with a further jump to 173,138,400 kilowatt-hours in 1957, a gain of 525 per cent from 1952 to 1957. Put another way, the connected load of customers in chemical and allied industries increased from 5,800 kilovolt-amperes in 1952 to 34,920 kilovolt-amperes in 1957. The Chemstrand plant increased its capacity from 50 million pounds per year to 114 million pounds per year. In addition to being a large user of electric power, Chemstrand also consumes a large quantity of natural gas, used mainly as boiler fuel. Under full load each of its six steam units will consume 260,000 cubic feet of gas per hour. Less than 2 per cent is used for processing.

One of the things that contributed to growth of chemical processing in the Pensacola area is a plentiful supply of natural gas. The area is served by the United Gas Pipe Line Company, which also serves a substantial part of other chemical-producing areas in the South. Peninsular Florida is not yet served with natural gas, but work is progressing on a statewide system being built by the Houston Texas Gas & Oil Corporation, with headquarters in St. Petersburg. Completion is scheduled for mid-1959. This may bring

THE IMPACT OF CHEMICAL INDUSTRY ON ELECTRIC-GAS UTILITIES

Natural Resources and Utilities Have Helped Alabama

"PLENTY of electric power and natural gas, abundance of water for navigation and processing, the presence of large supplies of salt and other favorable factors presage a large future development of the chemical industry in the state [Alabama]. Alabama Power Company is preparing for just such an event with a river development program that will not only greatly increase its power capacity but make many more industrial sites available. One of the most ambitious projects now under way is the Lewis Smith dam on the Warrior river. It will be 300 feet high, 2,200 feet long, and will create a deep lake with 500 miles of shore line. Its powerhouse will have an 80,000-kilowatt generator initially, with another of the same size to be installed later."

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additional chemical plants to peninsular Florida.

The long-established phosphate mining industry in the central-southwestern area of the state is a large user of electric power, furnished by the Florida Power Corporation, whose sales to that group in 1957 amounted to 376,484,000 kilowatt-hours, a gain of 33 per cent since 1948, during which time most of the companies added processing to their mining operations.

A RECENT chemical acquisition in Florida is the Michigan Chemical Corp., which is building a $5 million plant at Port St. Joe, near Panama City, for extraction of magnesium-oxide from sea water. It will be a substantial user of electricity from Florida Power.

"We look upon chemical plants as being units in a complex," said Andrew H. Hines, Jr., director of the industrial development department of Florida Power. "For example, the magnesium-oxide plant should serve as a basis for attracting other plants, including those which use substantial amounts of magnesium-oxide for refractories or other purposes. We believe there will be a gradual expansion of the chemical complex along the Gulf coast eastward from the Mississippi valley

area into northwestern Florida and eventually as far south as the Tampa Bay area. This expansion has already begun in the Pensacola area, but the announcement by Michigan Chemical foreshadows the advance eastward along the Florida coast."

South Atlantic States Second In Chemical Expansion

TAKEN as a whole, the South Atlantic states—Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida—have ranked second in the country, next to the Texas, Louisiana, Oklahoma, and Arkansas grouping, in the volume of chemical plant expansion. Three of these states—West Virginia, Tennessee, and Florida—have been in the top ten, while North Carolina, Georgia, and Mississippi have been among the top twenty.

The Duke Power Company, whose service area includes most of North Carolina and South Carolina, has benefited to a marked degree from the growth of chemical plants, of which a majority is in the Charlotte, North Carolina, area. "The service area of the two states in which we deliver power has, in the past ten years, had an exceptional growth in the development of industrial plants, many of which are manufacturers or processors of chemicals or allied products," commented Channing B. Brown, manager of the industrial power department of Duke Power. Some of these are very large plants, such as du Pont's silicon plant at Brevard, North Carolina; the Great Lakes Carbon Corp. plants at Morganton, North Carolina, for producing carbon electrodes; Lithium Corporation of America, concentrating lithium ore at Bessemer City, North Carolina; Pittsburgh Plate Glass Co.'s plant at Shelby, North Carolina, for production of glass fibers and a similar plant at Anderson, South Carolina, owned by Owens-Corning Fiberglas Corp. All of these and others are large users of electric power. Duke Power counts 35 chemical-processing plants in its area with contract demands of upward of 100 kilowatts.

EVEN when chemical plants develop a large part of their own power requirements, as is the case at the du Pont and American Enka plants in the Carolina Power & Light Company's service area, there is an indirect benefit from the large employment these companies give, which results in home building and expanded use of electric appliances. The great growth of the textile industry in the Carolinas has brought in many chemical plants that supply the chemicals used in processing textiles.

In its booklet, "The Chemical Industry Grows with Virginia," the Virginia Electric & Power Company points out that the chemical industry really got started in that historic state long before electricity became known. In 1608, the year following the founding of Jamestown, a glass factory was established in the colony. Virginia's first exports that year included glass, pitch and tar, and potash. Virginia also has another "first." The first chemical plant in America to make sulphuric acid from pyrites was established at Richmond in 1882. The first commercial salt production at Saltville dates back to 1788. Saltville was the sole source of supply to the Confederacy, and in 1917, during World War I, it "again became of military importance when a U. S.

Army Chemical Warfare service plant was built there."

WITH this heritage, Virginia can lay claim to being perhaps the oldest chemical manufacturing state in the country. Little wonder, then, that it has become "Virginia's fastest-growing industry." Clark P. Spellman, manager of area development for Virginia Electric, points out that "through the years the chemical industry is one of the three major factors of the state's economy." In terms of electric power used, nine major chemical manufacturing companies with a demand of over 500 kilowatts that Vepco serves, the increase in load between July, 1953, and July, 1958, amounted to 43,000 kilowatts.

"Even this partial growth," said Mr. Spellman, "indicates the importance of this industry to the company and the economy of its area." The MCA survey shows that more than $81 million will be spent during 1958 and 1959 for new chemical-processing facilities in Virginia. For the three-year period 1957-59, the total is nearly $85 million. Virginia ranks ninth in the country in chemical production and twelfth in the MCA construction survey.

Although West Virginia is placed by MCA in the grouping of South Atlantic states, its chemical complex is aligned more closely with Ohio, Kentucky, and western Pennsylvania in use of electric power and gas. Chemical production is the largest manufacturing industry in the state, outranking steel, for which it is probably better known, and expansion of chemical-processing facilities is still going on.

For the three-year period 1957-59, MCA estimates total construction expenditures at above $278 million, representing 39 privately financed projects in 17 communities. Thus it is third in chemical construction, next to Texas and Louisiana, and eleventh in chemical production nationally.

ONE of the companies that has greatly benefited from chemical plant developments over the years in the Ohio and Kanawha river valleys is the American Electric Power Service Corporation. Low-cost electric power, because of an abundant supply of coal nearby, and the presence of salt, brine, and limestone along the Ohio river, have been factors in West Virginia's chemical plant growth. Many of the country's best-known chemical companies are represented there, including such names as du Pont, Carborundum, Linde, Solvay, National Aniline, Union Carbide, American Cyanamid, American Viscose, and others. One of the more recent acquisitions is a $9 million plant at Apple Grove, West Virginia, for the Goodyear Tire & Rubber Com-

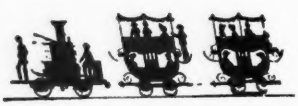
¶ "THE Alabama Power Company has had an important rôle in the chemical industrialization of Alabama, not only in a long-range power expansion program, including hydroelectric development, but also in inducing chemical companies to locate there. Discovery of a salt dome several years ago under what was then the little town of McIntosh, which has since had a mushroom growth, sparked the chemical construction boom in Alabama."

pany to manufacture a new plastic, Videne, a polyester laminating film that can be adhered under heat to a wide variety of products. An important natural gas development in this area is a plant being built at Kenova, West Virginia, by United Fuel Gas Company, subsidiary of the Columbia Gas System, for the extraction of mixed liquid hydrocarbons from its Appalachian natural gas stream. A fractionation plant is also being built at Siloam, Kentucky, to separate the mixed stream into ethane, propane, butane, and natural gasoline. The stream will be transported by pipeline. Pipeline and fractionation plant will be owned and operated by Columbia Hydrocarbon Corporation, a new subsidiary recently formed by Columbia Gas. Columbia Hydrocarbon will utilize ethane for the manufacture of ethylene.

ANOTHER interesting development is in nearby Kentucky, where a $10 million plant is being built near Ashland by the Ohio River Chemical Co., newly formed by the Industrial Rayon Corp. and Spencer Chemical Company, for the manufacture of caprolectam, a basic raw material used in the manufacture of nylon.

The third and final instalment of "The Impact of Chemical Industry on Electric-Gas Utilities," which will appear in the next issue of the FORTNIGHTLY, will describe the enormous effect chemicals have had on the economy of some northern, midwestern, and western states.

Part III of this article will appear in the next issue of the FORTNIGHTLY.



"THE evolution of society during these last fifty years has been restricting the field for private enterprise for personal profit.

"And, in the dangerous age into which we have moved, all-out competition in economic affairs would have to be restrained, even if it were still practicable. We can no longer tolerate the evils of private enterprise. But can we ever afford to do without its benefit?

"If we had to restrain it in the fields of economics and politics can we find compensatory outlets for it in the fields of art and science and scholarship and religion? The one thing certain is that we shall defeat our own purposes in the long run if, in the cause of security, we try to close all outlets for enterprise, ambition, and creativity in any field of human activity.

"Is it possible to foster freedom in some fields when one is compelled to restrict it in other fields? This, I believe, will be the burning question for the human race, if and when we succeed in building a world government that will save us from destroying ourselves."

—ARNOLD J. TOYNBEE,
British historian.

Utility Problems during Inflation

By HERMAN L. GRUEHN*

Three forces—unprecedented growth, inflation, and the leverage which inflation exerts on the financing of expansion—will strongly influence the operation of utilities in the next few years. Proper determination of the rate base will become insistently more important. Some new approaches to rate regulation may have to be devised. And financing definitely will pose some complicated problems as costs and prices mount.

DURING a recess in a recent rate case hearing a newspaper reporter said to me, "I just don't understand what you all are talking about this morning." I replied that I did not wonder, but added that if the talk could be restricted to the presentation of the really essential facts of the company's problem to the commission, he would not only understand the discussion but he might even be interested. It would not have taken long to finish talking, either. I did not wonder, however, that even a man skilled in writing for the average intelligent reader could not really feel at home with such discussions involving such words and expressions as "terminal" *versus* "average rate bases," or "imbedded costs of money" (whatever that is), or the distinction between reproduction costs and current costs, or the concept of accrued depreciation, or of "normalized" income accounts. Many other technical matters which now get into the record of a carefully conducted rate case before a thorough public service commission are equally baffling to the uninitiated.

PERHAPS the utility industry has not yet mastered well enough the art of successfully presenting to the public the essence of a complex industrial story. For

*Vice president, Baltimore Gas & Electric Company, Baltimore, Maryland. For additional personal note, see "Pages with the Editors."

example, I doubt if utility customers understand how amazing has been the performance of the gas and electric industries in holding down the price of their products, particularly during the postwar inflationary period. Probably the performance of the company with which I am associated is not substantially different from that of the gas and electric industries as a whole. The fact is that it has been selling its products for a bit less in the aggregate than if the price schedules at the bottom of the depression in 1932 were still in effect, and at only slightly above the levels in effect in 1945 before the present inflation began. Matched against all that has happened to costs during the interim—to wage levels, tax levies, coal and oil prices, equipment prices—that performance is a bit spectacular. Is this not the kind of essential fact which the public should know at the time utility prices are up for judgment?

It seems to me that a continuing pressure of several large forces upon the gas and electric industries is going to make it necessary during the next decade or so to re-emphasize a few fundamentals of the utility business, and perhaps even to evolve a few new approaches to rate regulation.

Most certainly, a way of getting the public to better understand utility problems and proposed solutions must be found. One of these forces is, of course, continuing inflation. Another is the foreseeable large growth in the volume of gas and electricity which must be supplied. The third is the leverage which inflation exerts upon big expansion, for this interaction becomes a force in itself and has many ramifications.

What about inflation? The decreasing value of money has been a major fact in the economic affairs of utilities for quite a period, and particularly so since the close of World War II. It has not been solely an American but rather a world-wide phenomenon, and is political as well as economic in nature. Thus, the annual report of the Bank for International Settlements indicates that for the postwar period 1946 to 1956 the annual rate of depreciation in the value of our dollar has been 3.7 per cent, whereas the annual yield on government long-term bonds has been about 2.2 per cent. In other words the rate of decline in the value *of* the money has been about 1.7 times as much as the return *on* the money. And about the same relationships have occurred in Denmark, England, Sweden, Netherlands, Norway, and Italy; the depreciation has been less in Switzerland, but much more in France. Incidentally, a 3.7 per cent compounded rate of depreciation in the value of the dollar is equivalent to a 50 per cent rise in prices every eleven years—a more striking way of measuring how fast inflation can "creep."

Whatever the causes, and while industry apparently can have periodic chills during its fevers, a continuation of the economic erosion which we call "inflation" seems to be the likely probability for some years to come.

Prospects for Growth

What about further growth? The public's need for energy in the form of electric power has been more than doubling every ten years on the average, for half a century. Various skilled forecasters say it will continue to increase at that rate for a number of years into the

future. About the same story applies to the public's use of energy in the form of gas: Last year it was about two and one-half times what it was ten years before and five times what it was twenty years before. For both gas and electricity these increases are respectively on the order of about 7 per cent and 8 per cent compounded annually when measured over three or four decades, and at a rate approximately 10 per cent for the past decade. Compound rates of this magnitude and over so long a period represent a really tremendous economic force and they also reflect a growth momentum that is not likely to terminate soon. Indeed, such statistical tools as are available for the projection of growth curves produce answers which place the possible cessation of large expansion in our gas and electric industries so far beyond the ensuing period for which definitive business plans can be intelligently made that there is little point in trying to forecast when the growth will stop.

ANY series that proceeds at compound rates like 7 per cent to 10 per cent reaches big numbers in a hurry. So, it should surprise no one that utility plants and facilities must again be greatly increased, and that prospective needs for new capital to pay for them are enormous. The electric industry did not reach $10 billion of utility plant until about the mid-1920's. It reached $20 billion about the end of 1949, roughly a quarter-century later. It reached $30 billion only five years later in mid-1954, and reached $40 billion at the end of 1957, only three and one-half years thereafter. It obviously takes tremendously more and more money per year to maintain such high rates of growth, even without inflation.

IN this light one can understand the reasonableness of a forecast such as was made for the electric industry by Lloyd Brace, president of the First National Bank of Boston, who said last June that "perhaps a fair estimate of the total new construction needs of the investor-owned utilities for the eight-year period 1958 to 1965, inclusive . . . would be $40 billion. This would work out to an average annual value for plant expansion *more than double that of the period 1948-57.* It would likewise be about $5 billion more than the *total* estimated electric utility plant account at the end of 1957." I have no trouble with Mr. Brace's forecast nor with his statement about doubled needs, because it represents a compound annual increase of about 9 per cent, which is quite in line with what utilities have actually been meeting for a decade. And while I have no corresponding data for the gas industry, I would not expect to

¶ WHEN inflation continues to a substantial degree it becomes unavoidably necessary to recognize that the results of an accounting system are not properly usable for the determination of income, depreciation, property costs, or taxes if they ignore substantial changes in the currency in which the measurements are expressed. After more than forty years of both "creeping" and "running" inflation there seems to be a clear understanding—in France, at least—that the recorded book costs of plant and property have little significance, and that depreciation appropriations based on cost are also meaningless.

find a substantially different story than for the electric. That story says that there will be a much larger need during the next decade for new capital funds than the gas and electric industries have ever had to obtain in a comparable period of time, even though there is no further inflation.

Actually, the leverage of inflation upon big expansion is, as I have already remarked, a separate problem in itself. The same piece of equipment to be installed today costs more than the average cost of what is already installed. I suppose almost any utility's books will show that. It takes a good deal more than the cost of the particular item being replaced to make the replacement. Thus even if the price level increases no further, the utility industry can expect a rising trend for some time in the average unit cost of the total utility plant in service. Further inflation can be expected to produce a larger rise in that trend, with resulting repercussions on costs, selling prices, and finances. I have the feeling that the effect of this third problem may not yet be adequately understood in the areas of management, regulation, and taxation.

Three Powerful Forces

The effects of these three forces—large growth, inflation, and the leverage which inflation exerts on the financing of an expansion—come to a head in two very practical arenas: in the market place where new capital funds must be obtained, and before the public regulatory authority where the allowable selling prices for utility services are determined. The market place is understandably quite sensitive to what happens in the regulatory arena. The utility's problem is to remain able to supply its products to communities in the volumes desired by them, at a price not in excess of the value of those products and as much under that as it can manage, but nevertheless at a price under which the requisite new capital funds will flow freely into its industry. Only then can it cope with continued growth and change. This point of balance is a pricing problem—essentially a long-range problem of financial management—and it requires the consent of the public and hence its understanding.

The two quantities in which the investor is primarily interested are the return *on*, and the return *of*, the capital invested in the utility's operations; and their adequacy determines whether enough new capital, particularly new risk capital, flows into the utility industry or whether it does not. These are, at the same time, the principal items around which revolve most of the difficult discussion in rate case proceedings. They are also the ones most affected by continued inflation. Getting right answers to these two quantities is the crux of the whole problem.

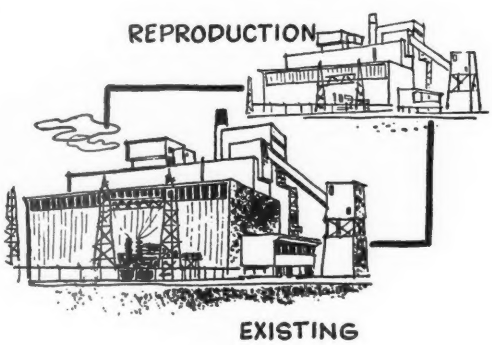
Under the customary rate case methods the allowance for both the return *on* the capital, and the return *of* the capital is heavily influenced by the value which the regulatory body places on the capital investment itself. Combined with the rate of return it determines the allowable operating income, and combined with the annual rate of depreciation it determines or measures the reasonableness of the depreciation expense allowance. The proper determination of this value—the rate base—is becoming more difficult as inflation proceeds; yet the correct answer is also becoming more insistently important.

Utility accounting systems, prescribed by public authority, furnish a great deal of the factual material on which the regulatory process operates, and it was intended that they should. But it is becoming increasingly necessary to recall that a fundamental premise of accounting systems generally is the assumption that over the years the dollar has a reasonably stable purchasing power. That premise is being significantly violated in respect to the dollars recorded for utility plant and for depreciation expense. It needs increasing re-examination as inflation proceeds, for one does not have a sensible measurement when identical objects are stated at prices which vary as widely as is now the case in almost any utility's books. The effect of violating the premise is proportionately much more severe in utility operations than it is for almost any industrial enterprise, because our plants and facilities represent about 85 per cent-90 per cent of all our assets, and because they are quite long-lived property as industrial processes go.

SOMETIMES it helps to understand a problem if one extends its terms. A good illustration in this context can be drawn from French experience, for after more than forty years of both "creeping"

Inadequacy of Regulatory Methods During Inflation

"THIS method of putting on the rate of return all of the burden of adjusting for currency depreciation, instead of putting all or most of it on the calculation of the utility's rate base in today's dollar, therefore seems inadequate as a useful regulatory device if inflation continues much further. Where I find the record weak on how to determine a rate base that is sound and fair is on the point of how much weight to give to the measurement of a utility's property in current dollars, and how much to the measurement expressed in the dollars of various size which one finds in the books of account. It seems to me that the 'whys and wherefores' of how much effect each of these (or other) measurements should have in the final answer need to be developed by people in the utility industry as well as by the regulatory bodies."



and "running" inflation there seems to be a clear understanding—in France, at least—that the recorded book costs of plant and property have little significance, and that depreciation appropriations based on cost are also meaningless. Business enterprises are, therefore, permitted at any time to revalue fixed assets based on government price indices, using a multiplier which varies with the date of acquisition, and to credit revaluation reserves in that connection, and to base depreciation charges on the revalued property. Nor are the valuation reserves, or increases therein, taxable. Appropriate treatment is also given to inventories, and reserves are used annually to counteract inflation for these assets, too.

My point is simply this: When inflation continues to a substantial degree it becomes unavoidably necessary to recognize that the results of an accounting system are not properly usable for the determination of income, depreciation, property costs, or taxes if they ignore substantial changes in the currency in which the measurements are expressed.

Rate Base Problems

I AM aware of the psychological difficulties involved in such redeterminations. Particularly in the utility industry is "write-up" a dirty word. So is "revaluation," at least when it means "upward revaluation." The concept "reproduction cost" is often belabored by regulatory commissions, and the use of "present-day costs" or present-day worth as a tool of measurement is suspect even though it is regularly used in the conduct of current business operations. Nor, when these measurements are rejected, is there usually any suggestion by regulatory authorities of what measurements would help them to find rate bases that are realistically appropriate to a depreciated currency. The impasse reminds me of a well-known verse by Hughes Mearns:

"As I was going up the stair
I met a man who wasn't there
He wasn't there again today,
I wish, I wish he'd stay away."

However, like that fabled little man on the stairs, the problem of coping with the changes in the value of the currency when determining rate bases just won't go away simply by ignoring it.

ADMITTEDLY, the rate base standing alone is not necessarily the vital item in this matter of arriving at the fair and necessary earnings on the capital investment. It is the end result of multiplying the rate base by the rate of return which is of practical consequence. For a long time many regulators have held the theory that a rate base as produced by the utility's accounting system can be used regardless of price-level changes—with incidental administrative advantages and ease of regulation. Under this theory only the rate of return needs alteration in order to produce the earnings required by current facts. The trouble with that comfortable theory is that the rate of return itself needs to be geared to some standard of reasonableness. Generally that standard is based fundamentally on the cost of money, with such additional allowances as are required for the factors which money costs do not by themselves cover.

Unfortunately this theory of varying only the rate of return runs into serious administrative difficulties as the gap be-

tween today's dollar and yesterday's dollar widens. One can demonstrate it facetiously by saying that it would make no difference in the end result if a utility company's telephone number is used as its rate base, provided only that the rate of return is made large enough to produce the appropriate earnings. It is *not* a facetious example, however, to point out that something like it would be involved if we had gone or were to go as far along the inflation road as France and some other countries have already gone. In both illustrations the use of a rate base and such a rate of return would have reached the point of uselessness as standards, since neither would measure within reasonable limits what it purported to represent. In any event, if the rate of return which results from this theory gets too far away from current costs of money, then one must doubt if the theory would be understood and accepted by the public.

THIS method of putting on the rate of return all of the burden of adjusting for currency depreciation, instead of putting all or most of it on the calculation of the utility's rate base in today's dollar, therefore seems inadequate as a useful regulatory device if inflation continues much further.

Where I find the record weak on how to determine a rate base that is sound and fair is on the point of how much weight to give to the measurement of a utility's property in current dollars, and how much to the measurement expressed in the dollars of various size which one finds in the books of account. It seems to me that the "whys and wherefores" of how much effect each of these (or other) measurements should have in the final answer need to be developed by people in the utility industry as well as by the regulatory bodies.

I would suggest that a useful starting point is the fact that a supplier of risk capital considers—and has the right to consider—that he owns property. He does not own merely a dollar interest therein. He also has the opportunity to place his money in industries where he can get the rights as well as the risks of owning property.

This vital distinction remains even if he is willing to accept a limitation against the full operation of changes in price levels, up or down, because of the public nature of the business. Under this line of thought one can reach the conclusion that the practical solution to the dilemma in question is to give the worth of the property in present-day dollars the

¶ "ANY series that proceeds at compound rates like 7 per cent to 10 per cent reaches big numbers in a hurry. So, it should surprise no one that utility plants and facilities must again be greatly increased, and that prospective needs for new capital to pay for them are enormous. The electric industry did not reach $10 billion of utility plant until about the mid-1920's. It reached $20 billion about the end of 1949, roughly a quarter-century later. It reached $30 billion only five years later in mid-1954, and reached $40 billion at the end of 1957, only three and one-half years thereafter. It obviously takes tremendously more and more money per year to maintain such high rates of growth, even without inflation."

same weighting as the utility's risk capital bears to its total capitalization.

If, for instance, that ratio were 45 per cent, then 45 per cent weight could be given to current values of the utility's property and 55 per cent to book costs. Such a pragmatic weighting would lie between the extreme positions of giving complete recognition or giving no recognition to present-day dollars. By gearing the weighting to the risk capital the method would go a long way toward meeting the requirements of the risk capital supplier, though at the same time it recognizes the wisdom of having a formula which endeavors to provide adequate coverage of the preferred stocks and bonds during depressed periods.

There may be better ways of solving the problem; my point is simply that as inflation continues its distorting effects the problem of how to compute a fair amount of earnings which should be allowed on the capital invested does need to be solved in a practical way that may be somewhat different from today's methods.

The second item for which right answers are necessary is the depreciation expense allowance—the return of the capital investment as property is used up. An interesting page one editorial by George Shea in *The Wall Street Journal* of last August 4th dealt with the effect of inflation upon the depreciation expense problem, for industry in general. It got to the heart of the matter by saying:

> Now, obviously it is sound business for growth to be financed out of new capital that comes from savings, whether those of the business itself or the savings of investors to whom it sells new securities. But equally obviously, it is unsound if mere maintenance and replacement have to be financed with new savings. Yet that is what happens under inflation. . . .

Certainly that in a large way is the situation in the gas and electric industries today. There is a serious gap between the dollars recovered through depreciation expenses for a given article of plant or equipment, and the cost of the equipment which replaces it, even where the new equipment is no more productive than the old. Those additional dollars now have to be gotten entirely from new savings, whereas it would appear that the user for whom those facilities were originally supplied should have furnished at least some of those dollars.

I believe that the recent accelerated depreciation provisions of the income tax law have worked fairly well for most unregulated industries as a practical device for coping with this phase of the inflation problem; but two circumstances make a similarly effective result less feasible for utilities. One is that the useful life cycle for most industrial property is apparently much shorter than for the utilities, and an acceleration of that shorter period thereby gets the effective recovery period down to a relatively short time for most of the dollars to be recovered. The other is that industrial enterprises generally can and have charged the full accelerated depreciation to current income and have been able to sell their products at prices which cover the high depreciation charges. That is something the utilities cannot readily do as a practical matter—and is something that the so-called

Point of Balance Is a Pricing Problem

"THE effects of these three forces—large growth, inflation, and the leverage which inflation exerts on the financing of an expansion—come to a head in two very practical arenas: in the market place where new capital funds must be obtained, and before the public regulatory authority where the allowable selling prices for utility services are determined. . . . The utility's problem is to remain able to supply its products to communities in the volumes desired by them, at a price not in excess of the value of those products and as much under that as it can manage, but nevertheless at a price under which the requisite new capital funds will flow freely into its industry. Only then can it cope with continued growth and change."

"normalization accounting" and "flow through accounting" methods, which are in widespread use in the industry specifically, avoid even trying to do.

IT seems to me that efforts of the utility industries' depreciation committees to clarify the matter through their studies of what they call "economic depreciation" are much closer to the mark of what is reasonable and correct. Under that concept the annual depreciation rate is, in effect, applied to a property investment stated in today's dollars and not in historical dollars. Actually, that is what business and tax policy has had to come to in France under its inflation. While as a practical matter acceleration methods may be more feasible from a political, tax, and regulatory viewpoint than are the "economic depreciation" methods which necessarily depart from historical costs, they unfortunately do not seem adapted to the unique needs of the utilities.

Financial Soundness Mandatory

THESE observations about the regulatory treatment of rate bases during the continuing inflation which is in pros-

pect, and the resulting provisions for return of, and return on the investment, are based on a single underlying thought. It is that financial soundness is a "must," particularly during inflation, if utilities are to do their part of the job of successfully delivering the public's ever-mounting requirements for mechanical energy. "Financial soundness" comes down to the condition under which new capital (particularly new risk capital) continues to flow freely into our industry, in adequate amounts, as needed, and at reasonable costs. This end result is the hard core of the tests by which the usefulness of regulatory, management, and tax policies need to be judged during this period of big growth and inflation.

FORTUNATELY, there is no barrier at present to "financial soundness" in so far as the industry's economics are concerned. Utilities are in their "strong" years. Certainly the value of their products is substantially above the prices being charged: A comparison of today's prices with those of the depression and prewar years, in the light of what has happened to the prices of competing fuels, suggests it; so do estimates of how much—or how little—business they would lose if it were necessary to raise their selling prices quite substantially. In the utility business unit costs tend to decrease as volume increases, given a stable level of wages, taxes, and prices of materials. Fortunately, too, it takes only a quite moderate increase in selling prices to produce substantial increases in the earnings available for the support of securities, if and when more earnings are necessary. And the demand for utility products remains tremendous. In short, to the extent that the problem of selling prices is the deciding factor, there is no reason why financial soundness cannot be maintained.

BUT "financial soundness" involves more than the proper determination of selling prices for products, important as they are. Workable tax policies on the part of both communities and also the federal government certainly have a part. Accounting policies have a part, for the proper determination of what costs should be met today and what costs should be met in the future is certainly more difficult—and more significant—when the changing value of the dollar is a fact to be reckoned with. Certainly, financing methods and capitalization structures are a factor, too.

The experience of the railroad industry provides much material for study in this matter of "financial soundness" for it is an industry whose major characteristics include, like gas and electric utilities, a long-term life, a need for large investment in relation to annual revenues, and a public control over selling prices. Their experience is older. When one hears discussions today about the merits of higher debt ratios for our industries, or discussions about leverage in capitalization structures, or arguments for more or for less depreciation provisions, or accounting theories dealing with the capitalization of construction overheads, one might consider some of the fundamentals which the railroad industry can illustrate out of its longer history. Here we see a forest more important than the individual trees.

For example, one can compare three major eastern roads which in the late 1920's and early 1930's differed very little in their operating characteristics, but of

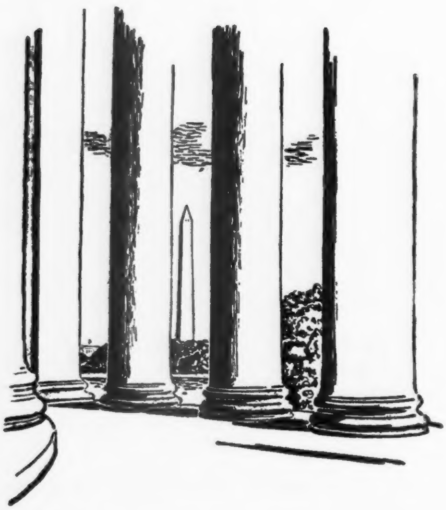
which only one avoided serious financial difficulties. Operatingwise it would be quite difficult to tell them apart: in their production of revenue per train mile, or in their operating ratios, or in the degree of shrinkage in their operating revenues during the depression years and the degree of their subsequent recovery therefrom, and particularly in their control of expenses during depression and recovery. The notable difference between them was that one of the three had to support a capitalization only about half as great, per dollar of revenue, as the other two; and even so, its common equity ratio was about twice as great. It did not get into difficulties.

One can compare a major eastern and a major western road which in the same period of years also differed little in their revenue production and operating characteristics. One of the two got into serious difficulties; the other did not, though its revenues shrank just as much. Actually the successful one had a bit more capitalization to support per dollar of revenue than did the other; but the difference lay in the balance between common equity and senior securities. The successful one had a 60 per cent equity, the other about 35 per cent; the greater financial soundness in terms of ability to ride through a period of shock spelled the difference.

There is the lesson that a free flow of capital into an industry, particularly risk capital, can end rather suddenly. In the nine years from 1922 through 1930 the railroads were able to sell large amounts of capital stock to the investment markets. Even in 1930, the first depression year, they sold $66 million. But in all the years since then the railroads' total sales of stock have aggregated only $21 million: In more than a quarter-century the total sales have been less than one-third of the sales in 1930 alone. Those total sales were not much different from one fair-sized issue by one gas and electric utility company in one year today.

There is also the lesson that despite these general developments, there are major railroads whose financial structures were strong enough to bring them to the point where today the per share earnings are substantially better than they were in 1929, even though they had to withstand the same bad shocks that affected the rest of the industry. Indeed, the growth in their per share earnings during the decade after the close of World War II was at compound rates of increase higher than the average performance of the gas and electric companies.

The time to make certain that financial soundness is a reality is during an industry's "strong years," when its economics permit it. Utilities are in that period now; but to remain so, they do need to handle with great care the large expansion which still lies ahead of them. The essential ingredients include a correct determination of today's full costs of operation, and selling prices which cover full current costs instead of deferring some of them to the future for someone else to meet, and the maintenance of investment attractiveness. To do it successfully the public and its representatives must not be like my reporter friend who did not know what we all were talking about. The stakes are too big for that.



Washington and the Utilities

Columbia Basin Development

HEARINGS last month in the Pacific Northwest on Senator Neuberger's proposal to establish a regional water-planning agency for the area disclosed sharply divided opinion on the best approach to comprehensive development in the Columbia basin. The four public hearings—at Portland, Oregon, Seattle, Washington, Coeur d'Alene, Idaho, and Kalispell, Montana—provoked great interest and were well attended.

Generally speaking, government power advocates were in favor of Neuberger's bill to create a Columbia River Development Corporation to take over the power-marketing duties of the Bonneville Power Administration and assume primary responsibility for future planning. If the proponents of government power development had any criticism, it was that the proposal does not go far enough in the authority it would give to the new corporation.

Spokesmen for private industry, however, took a different view of the proposal. They professed to see in the proposed corporation a "superstate" in the power field which would eventually drive them out of business. Allan A. Smith, general counsel of Pacific Power & Light Company, said the plan would knock out of action "a winning team of local utilities and federal agencies now engaged in the greatest hydroelectric program ever undertaken." Smith complained that the bill would give the corporation authority to build new hydro projects without congressional authorization and take over existing projects of private and public utilities. Senator Neuberger has denied this, and has agreed to clear up any ambiguity of this point in the final version of the bill he will introduce at this session of Congress.

DISAGREEMENT was also brought out among the governors of the four Columbia basin states—Oregon, Washington, Idaho, and Montana. Speaking for Oregon, both the outgoing governor, Robert D. Holmes, and newly elected governor, Mark Hatfield, presented statements at the hearing supporting the principle of a regional planning corporation. Hatfield, however, has some reservations. Hatfield questioned whether revised draft changes modifying the "public prefer-

ence" clause of the Bonneville Power Act could not be written to protect even further power supplies for Oregon by use of a "fair and equitable allocation" formula for distribution of power among the Columbia river states.

Governor Rosellini of Washington also threw support to the Neuberger proposal, but Washington state officials and public power groups there were plainly displeased with Neuberger's proposed amendment of the almost sacrosanct preference clause. As it now operates, the "preference" clause benefits Washington where power distribution is largely in the hands of public agencies. In Oregon, the bulk of the distribution of federal power is undertaken by private utilities. Oregon, naturally, would stand to gain the most from the change in the preference clause suggested by Senator Neuberger.

In Idaho and Montana, irrigation farmers and miners joined representatives of private industry in opposition to the Neuberger Bill. Reflecting Idaho's traditional jealous outlook toward upstream water rights, the irrigators expressed fears that the new corporation, concerned primarily with power, would find ways to disregard water uses for other purposes, despite provisions in the bill designed to safeguard such rights. Running through the testimony in Coeur d'Alene was concern that Idaho and other upstream states would lose out to Oregon and Washington's interest in power development if the corporation bill becomes law.

Speaking for investor-owned utilities, Kinsey Robinson, president of Washington Water Power Company, found objections to the bill in every particular and declared it unnecessary to achieve full power development. He said that with present plans of public and private utilities, plus contemplated federal construction by existing agencies, the Pacific Northwest will have adequate power supplies not only for the next ten years, but in perpetuity. Robinson objected to the self-financing features of the bill as "a masterpiece of chicanery." He said the federal taxpayers would be required to carry a heavy burden of the cost and that the creation of the corporation would probably slow down development of non-power uses in multipurpose projects.

Robinson also objected to that feature of the bill which would place, he said, overall power in the general manager appointed by the President while the proposed five-man board would be only a review board. "Under the terms of this bill," said Robinson, "a corporation is given very broad powers, more than adequate to make its general manager a dictator of all power operations in the Northwest. . . . We do not want nor do we need a power dictator in this part of the country."

Some of the strongest criticism of Neuberger's proposal came from Governor Hugo Aronson of Montana. In a statement read for him at the hearings in Kalispell, Aronson went on record against the bill on the grounds that it would undermine and override the water laws and property rights of the states. He said it would be another way of taking away the last rights of the states in their most important resources. "Every aspect of this warmed-over CVA (Columbia Valley Authority) is repulsive to the principles of free enterprise, which have made our nation the greatest in the world."

The "308" Report

While hearings on Neuberger's proposal were in progress, the Army Corps of Engineers released its long-awaited revision of its "308" report which recommends that Congress authorize 13

new projects in the Columbia basin which would have an aggregate power output of roughly four million kilowatts and provide nearly 24 million acre-feet of additional flood-control storage for the basin. Total estimated cost of the projects is $1,-897,143,000.

The most significant recommendation in the report, and one that is bound to be controversial, was its proposal for construction of a high dam at the Mountain Sheep site on the Snake river in Idaho. It will be recalled that a group of investor-owned utilities—Pacific Northwest Power Company—have now pending before the Federal Power Commission a plan to construct a high dam at this site, in lieu of their rejected proposal to construct a dam at Pleasant Valley. The FPC turned down the Pleasant Valley dam in favor of a dam at Nez Perce, despite the fact that a dam at Nez Perce would interfere with salmon fish passage. The result is that the FPC is on record for a high dam at Nez Perce as the best suited for comprehensive development of the area, while the Corps of Engineers' report indirectly supports the proposal of Pacific Northwest Power Company. The report, of course, makes no recommendation as to who should build the Mountain Sheep dam. But the fact that a project at this site has the support of the Army Engineers may lend weight to the private company proposal when it comes before the FPC for final determination.

Influence Probe

THE House Subcommittee on Legislative Oversight agreed just before Christmas to call for a sweeping extension of its year-long investigation of the operations and activities of federal regulatory commissions. The report also recommends stiff new laws aimed at preventing backstage attempts to influence the agencies in their decisions.

The proposed new investigation would seek to dig deeper into the activities of the FCC, FPC, SEC, ICC, CAB, and FTC, all of which were investigated to some extent last year. The report also proposes dozens of new studies, including whether legislation is needed to improve the quality of TV programs and whether broadcasting networks should be licensed.

THE evident purpose of the report is to create a climate of opinion which will favor the creation of a permanent congressional committee, probably a subcommittee of the House Interstate Commerce Committee. The present subcommittee officially went out of business on December 31st. The proposed new committee would expand its scope of operations to take in other federal agencies.

The subcommittee report called for a broad attack by Congress, "aimed at eliminating flagrant abuses and certain conditions and practices which are conducive to fostering improper" backstage influence attempts. Proposed legislation would: (1) provide civil and criminal penalties for anyone attempting behind the scenes to influence regulatory agency commissioners or staff members regarding "any proceeding or projected proceeding" before the agency; (2) provide similar penalties for anyone who "aids or abets" such backstage attempts; (3) make mandatory insertion in the public record of any written or unwritten communication to an agency about a case from a Congressman or executive department official; (4) provide civil and criminal penalties for agency commissioners or staff members who fail to make such communications or behind-the-scenes contacts part of the public record; (5) provide similar penalties for commissioners and staff members who

"leak" secret agency votes, opinions, or recommendations; (6) tighten laws governing the regulatory agencies in a number of specific instances; and (7) establish a general code of ethics for all six regulatory agencies, backed with civil and criminal penalties for violations.

Atomic Developments

PROPONENTS of increased government activity in the development of atomic energy for peacetime purposes have been quick to make the most out of the decision of two investor-owned utilities to drop plans to build a large-scale homogeneous type atomic power plant. While the reasons given for abandoning the project by the two companies involved—Westinghouse Electric Corporation and Pennsylvania Power & Light Company—have been given sympathetic treatment in numerous editorials, including those in newspapers which might have been expected to take a different view, the reaction of Chairman Anderson of the Joint Committee on Atomic Energy probably indicates the line that government power advocates will take in their efforts to force greater participation by the federal government. Said Senator Anderson: "This project demonstrates the fallacy of expecting private industry to provide the technical direction and financing for construction of advanced reactor concepts."

Anderson strongly hinted that he would oppose another private company proposal —the plan of over 50 utilities, headed by Philadelphia Electric Company, to construct an advanced gas-cooled reactor. Anderson is understood to favor federal construction of a gas-cooled plant of more traditional design. "We may have to decide whether we should walk before we try to run," Anderson said. "I believe it is undesirable to permit the field of advanced atomic power concepts to be 'staked out' as the private domain of industry. . . . I hope the AEC and parts of industry will re-examine their views in the light of PP&L experience."

ANDERSON'S statement is a clear warning that the annual fight over government *versus* private development of atomic power will be renewed in this session of Congress. Equally distasteful to Anderson, apparently, is the proposal by the AEC to concentrate future development work on just a few nuclear reactor types now under study. According to an AEC spokesman, only five reactor concepts are likely to be chosen for full-scale commercial development. It has been indicated that the AEC will give up on the other less promising reactor types now under study.

Such a decision on the part of the AEC would mark a significant departure from past AEC policy. Until now, the commission has favored the simultaneous development of many different reactor types, as long as they offer hope of hastening the arrival of cheap atomic power.

It is believed that the Joint Committee will almost surely oppose the AEC policy change. The committee has always felt that the government should push work on more reactor types rather than less. However, the AEC decision to emphasize only five reactor types does not mean that the agency will break existing commitments to study other concepts. Nor does it mean that the commission will completely abandon basic research on new and different concepts. But it does mean that the commission will help to underwrite construction of bigger plants only if they fit into the categories deemed most promising after suitable investigation.

Telephone and Telegraph

World Telephone Statistics

For the first time since 1936, statistics on the number of telephones in Soviet Russia have been included in the annual survey published by the American Telephone and Telegraph Company, entitled "The World's Telephones." The 1958 issue which, because of the necessary lag in accumulating data, contains figures as of the beginning of 1958 rather than for the end of it, shows the USSR with 3,558,000 telephones. This amounts to two telephones for every 100 population in the Soviet Republic. The United States continues to lead the world with more than half the telephones on the globe, with a total, as of that time, of 63,621,000 telephones. This would be 37 for every 100 population. The per capita average for the whole world was four telephones for every 100 population.

Russia ranked sixth among the major nations in the total number of telephones. After United States, came the United Kingdom with 7.3 million, Canada with 4.8 million, West Germany with 4.7 million, and Japan with 3.8 million.

Countries scoring the highest on the per capita saturation of telephones were Sweden with 33 per 100, Canada 29, and Switzerland 27. The United Kingdom had 14 per 100, West Germany 9, and Japan 4.

The 1958 edition of "The World's Telephones" shows the United States averaged 460 conversations per person in 1957—trailing the Canadian average of 497 and the Swedish conversation rate of 491. The statistics indicate it is the inhabitants of the colder climes who make the most use of their phones. Geographically, the most talkative telephone area in 1957 was Alaska with an average of 581 conversations per person. Little Iceland also ranked high, averaging 452 per person.

An exception was Hawaii. The island territory with the travel-folder weather reported 522 conversations per person. The world in general—including savages who never even heard of a telephone—averaged 56 telephone conversations per person. This compares with 51 for the preceding year.

The telephone survey records a total of 117.8 million telephones in service in the world on January 1, 1958, a gain of close to 8 million over the previous year. Two cities—New York (4,204,007 telephones), and Chicago (1,800,103)—had as many telephones as there were in the huge continent of Asia, where more

than half of the world's people live. New York city alone had more than there were in France. Among foreign cities, London with 2,149,000 telephones had the largest number.

Washington, D. C., with 70 per 100 persons had the greatest telephone saturation for metropolitan areas. Stockholm, with 57, occupied first place in this respect among cities outside the United States. Moscow, with 454,000 telephones, had nine per 100 population.

REA Telephone Advisory Committee Reports

THE REA Telephone Advisory Committee recently submitted to REA Administrator Hamil a summation of the REA program to date and registered the view that very substantial progress is being made in the field of rural telephony. The committee, which met in Washington, D. C., late in November under the auspices of the Agriculture Department, feels that the telephone amendment of the REA Act as enacted by Congress in 1949, is being carried out and that the Administrator and his staff deserve to be complimented for the way the program is being conducted. Among other things contained in the recommendations of the advisory committee were the following points:

1. It was the consensus of the entire committee that the federal excise tax of 10 per cent on telephone bills and toll calls is a discriminatory burden on the telephone user, and that it is continuing to have a detrimental effect on the rural telephone program.

2. The committee feels that efforts must be continued to get the various states to pass enabling legislation to participate in the federal-aid highway program, as passed by Congress, with relation to relocation of utility facilities.

3. That joint use of pole line facilities should be continued. It was recommended that REA encourage, investigate, and promote more joint use of facilities within the rural electrification industry. It was observed that a wider application of joint-use construction, at a reasonable rate, will enable telephone borrowers to provide modern, dial telephone service to a greater number of people.

4. It was recommended that REA continue its fine work, in co-operation with the industry, in the development of new equipment and methods for the purpose of providing not only initial service, but improved service, to people in rural areas.

5. The committee concurred in the efforts being made by REA to develop a survey of its rural telephone program potential.

6. The committee was of the opinion that there should be a reappraisement of loan application procedures for the purpose of determining whether they can be shortened in order to speed up processing, particularly in regard to supplemental loans. A subcommittee was appointed to handle this.

7. It was also the opinion of the committee that the engineering service contract be reviewed. The purpose of this review would be to determine methods of streamlining the contract to eliminate duplication of effort and to define areas of responsibility in order to obtain a reduction in the cost of overall engineering services.

FCC Year-end Statement

THE Federal Communications Commission enters the New Year with

more than 2.1 million current authorizations in the radio field alone. This is in addition to existing grants for telegraph and telephone wire and cable systems, according to Chairman John C. Doerfer in his year-end statement for the FCC, released January 1st.

Its radio permits and licenses increased by about 200,000 during 1958. The present total represents the use of approximately 1.5 million transmitters, which is 250,000 more than at the close of 1957. These radio and wire authorizations attest to the vital rôle played by modern electronic marvels in expediting communication on the land, on the water, and in the air. This utilization extends from the individual citizen to business, industry, and public agencies.

THE FCC year-end statement showed that common carriers (telephone, telegraph, and cable) are expanding their use of radio for point-to-point telephone and telegraph communication, both domestic and international; also television relay, and rural radio and public land mobile services.

The nation's telephones are approaching 70 million. The great majority are now dial operated. About 250 million telephone calls are made daily.

One-way signaling systems for "paging" customers are on the increase.

Public telephone service to passengers on aircraft in flight is under test.

The nation's telegraph system handles about 150 million messages a year. Its eastern microwave system is being extended to Chicago, and links to St. Louis, Kansas City, Detroit, and Cleveland are in prospect.

More telegraph customers are receiving facsimile service in different forms in connection with their business operations.

International telegraph traffic by cable and radio exceeds 600 million words annually, and overseas telephone calls top 2.2 million.

The first telephone cables to connect North America with Europe and the United States with Alaska and Hawaii are in operation.

IN addition to trying to handle a work load which has practically doubled in the past five years with no more personnel and little increase in appropriation than it had then, the commission is beset with multiplying administrative, legal, and legislative problems, the statement said. They affect its overall operations.

Those in the broadcast field include consideration of recommendations of its special staff study of network broadcasting; what can be done to bring about more competitive TV facilities; whether more AM stations can use channels which bring programs from far stations to remote areas at night; the extent to which daytime AM stations could operate longer hours without serious interference to other stations rendering nighttime service; and whether FM stations can engage in additional supplemental services to augment their income.

Current major considerations in the common carrier field involve telephone and telegraph rates and services; divestment by Western Union of its cable operations as required by law; competition between private and common carrier radio systems; and the effect of an antitrust decision on telephone company lease-maintenance of mobile radio systems.

The demand for more and more spectrum space by business subjects the special radio services to innumerable proceedings which keep the covering rules and regulations in a constantly changing state.

Financial News and Comment

By OWEN ELY

AT&T Breaks Tradition, Splits Stock 3-for-1, Raises Dividend 10 Per Cent

AFTER maintaining its famous $9 dividend rate for thirty-six years, American Telephone and Telegraph Company on December 17th surprised both the financial district and the nation at large by suddenly proposing a 3-for-1 split in its stock. The announcement did not come at one of the closely watched dividend meetings, but at a regular monthly meeting of directors. The split is to be submitted for approval by stockholders at the annual meeting April 15th, and the new shares will then be distributed about June 1st. In July the cash dividend is expected to be raised to $3.30 a share on the new stock, equivalent to $9.90 on the old, an increase of 10 per cent.[1]

[1] See discussion in this department, September 11th issue (pages 396-9) and October 9th (page 565).

DEPARTMENT INDEX

The board believes that the proposed action will make the company's shares attractive to more investors and therefore widen the market for the company's stock. It will strengthen the position of the company in competing for the large amounts of equity capital that will be needed in the future to meet the nation's requirements for telephone service in our expanding economy.

During November AT&T had reached the 200 price level for the first time since 1946. (The high in the 1929 bull market was 310.) Following the announcement, trading in the stock had to be suspended for an hour and a half, after which the price was marked up $23 a share (over the previous close) to 225. The new level seemed warranted by the indicated 10 per cent increase in the cash dividend rate, which would make the yield 4.4 per cent compared with less than 4 per cent for most high-grade electric utility stocks.

DURING much of the 1930's and 1940's the Bell system was handicapped by a low rate of return on net property, which in 1947 declined to only 3.7 per cent. As the result of more intelligent and liberal regulatory policies, the return has been increased to more than 6 per cent, and while there is room for further improvement Bell has been able to earn a better

margin over the $9 dividend in the 1950's. (In a few earlier years the dividend was not fully earned.) Consolidated share earnings, now reported on an average share basis, increased from $9.70 in 1949 to $12.58 in 1950, but during the four years following the range remained slightly under $12. In 1956, however, earnings jumped to $13.10 from $11.92 in the previous year, and remained around the new level in the two following years. This year, with the help of improved business and rate increases, it looks as though telephone earnings might rise another $1 to the $14 level, or close to it. Despite the recession effects earlier this year, earnings for the twelve months ended August 31st were $13.53 and since that date the improvement may have accelerated somewhat.

At a talk before the Bond Club of New York in November, President Frederick R. Kappel reported that in September for the first time this year the gain in Bell system telephones over the previous year exceeded the similar gain made in the same month of 1957. Last winter and spring the number of new telephones installed had run about 40 per cent under those of the previous year. Despite this slow start, he expects the system to add about 2.5 million new phones this calendar year compared with 2.8 million in 1957. Long-distance calls are expected to exceed last year's by 5 per cent.

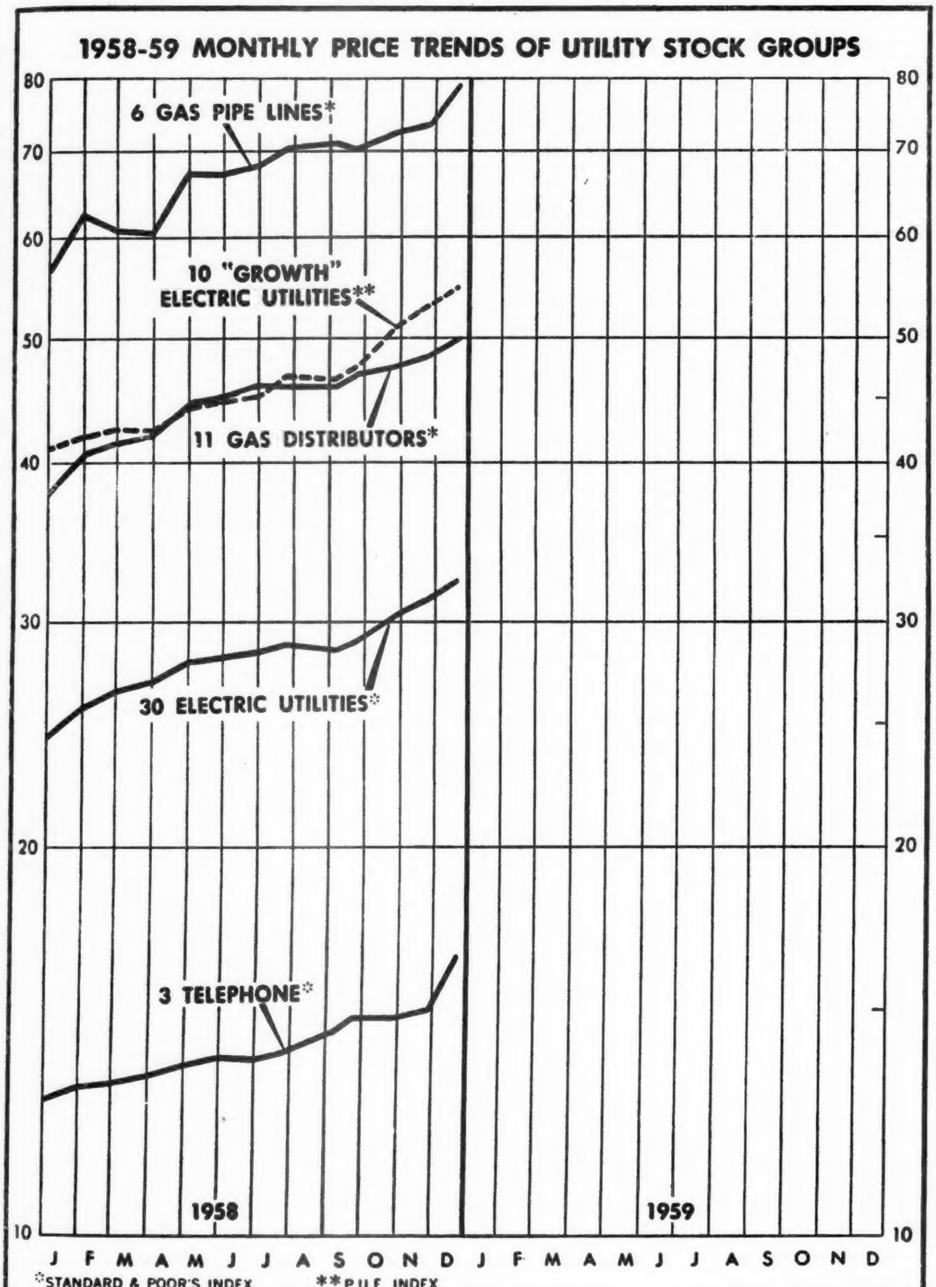
WHILE 1959 may not break any records, President Kappel thinks that improvement will continue, with the possible implication that the gain in share earnings may carry somewhat further. Construction outlays for next year will exceed $2 billion for the fourth straight year, and Bell Laboratories will carry on the largest research and development program in its history. The "Labs" will doubtless continue their research designed to automatize the system as extensively as practicable.

AT&T has also developed a new method to aid in the automation of American industry. Bell Labs have perfected the "dataphone," which converts electrical impulses from data processing machines into sounds and sends them over Bell system wires, after which they can be changed back to electrical impulses and fed into computers which process the information. Thus some 7,000 items of information can be transmitted from a branch to a central office in sixteen minutes, at regular phone rates. The new device is already in limited service.

Eventually, with the use of transistors (invented by Bell) and other "miniaturized" equipment, space and personnel requirements per unit of phone operations should be greatly reduced, with resulting savings. The customer himself may eventually do most of the manual work required simply by dialing, and his own bill will also be made up automatically. However, just as local dialing has taken years to complete, the new program may also take five or ten years for full development. If AT&T continues to obtain fair regulatory treatment—and not the shortsighted, punitive type which has prevailed recently in Louisiana—it can join the ranks of the dynamic "growth utilities" and continue its great contributions to American business efficiency.

Public Power Proponents Invading Atomic Energy Field

THE atomic power program remains as diverse and puzzling as ever. With increased Democratic power in Congress, it is possible that the scales may be tipped


1958-59 MONTHLY PRICE TRENDS OF UTILITY STOCK GROUPS
6 GAS PIPE LINES*
10 "GROWTH" ELECTRIC UTILITIES**
11 GAS DISTRIBUTORS*
30 ELECTRIC UTILITIES*
3 TELEPHONE*
1958
1959
80
70
60
50
40
30
20
10
J F M A M J J A S O N D J F M A M J J A S O N D
*STANDARD & POOR'S INDEX
**P.U.F. INDEX

in favor of greater participation by public power.

However, the private utilities are making a valiant effort to maintain their priority in the program, and to limit government expenditures to research and supervision.

Two recent developments may have strengthened the position of the public power group. The New York State Power Authority has proposed the construction of 400-500,000-kilowatt nuclear and/or steam-generating plants in order to "firm up" the irregular capacity of the big hydro plants which it now has under construction. It would like a federal subsidy for nuclear power, so that output could not exceed steam power in cost. The authority apparently assumes that, like TVA, it must provide for future power needs of the area by going outside the hydro field—in other words, it takes for granted that private utilities cannot plan adequately for future expansion of generating capacity. While it appears very unlikely that the AEC or the Republican state government of New York will back this plan, the proposal is of propaganda value to the public power interests in Washington.

Moreover, Senator Clinton P. Anderson, vice chairman of the Joint Congressional Committee on Atomic Energy and frequently its spokesman, declares that abandonment of the plan by Westinghouse Electric and Pennsylvania Power & Light to build a $108 million homogeneous reactor demonstrates the fallacy of expecting private industry to carry on with nuclear power development—despite the fact that some 40 private companies recently offered to build the gas-cooled atomic power reactor which the committee wants.

The AEC is making a reappraisal of its atomic power program and an advisory

CALENDAR OF PROPOSED UTILITY OFFERINGS
January 8-March 31, 1959

Date of Bidding Or Sale	*Approx. Amount (Millions)*	*Bonds and Debentures*	*Method Of Offering*	*Moody Rating**
1/ 8/59	$15	San Diego G. & E. S. F. Deb. 1984	C	A
1/13/59	20	Commonwealth Edison Mtge. Bonds	C	Aa
1/19/59	10	Gulf States Utilities Mtge. Bonds 1989	C	Aa
1/20/59	35	Southern Natural Gas Mtge. Bonds	C	A
1/27/59	12	Central Illinois P. S. Mtge. Bonds	C	Aa
1/ /59	60	Consolidated Edison Conv. Deb.	N	A
3/ /59	16	Monongahela Power Mtge. Bonds	C	A
—	30	Transcontinental Gas Pipe Line Mtge. Bonds	N	Baa
—	30	Cleveland Elec. Illuminating Mtge. Bonds	C	Aaa
—	20	Kansas City P. & L. Mtge. Bonds	C	Aaa
—	25	Public Service of Indiana Mtge. Bonds	C	Aa
—	5	Missouri P. & L. Mtge. Bonds	C	A
—	8	Hawaiian Electric Mtge. Bonds	N	A
—	6	Tucson G. E. L. & P. Mtge. Bonds		
—	10	Kansas P. & L. Mtge. Bonds	C	Aa
		Preferred Stock		
1/13/59	10	Gulf States Utilities	C	—
		Common Stocks		
—	40	Southern Co. Common Stock	C	—
1/ /59	15	Connecticut L. & P. Common Stock	N	—

*Preliminary rating, or rating of similar issue of same company. C—Competitive. N—Negotiated.

committee of top industry officials has been asked to report to it by the end of the year.

As yet the commission has apparently not abandoned any reactor types—it recently authorized completion of the controversial Fermi plant in Michigan—but under congressional pressure new developments may be forthcoming.

Russia's Generating Capacity About One-third Ours, Expansion Program Half

At the end of 1957 Russia's installed generating capacity was about 48 million kilowatts compared with the overall U. S. figure of 146 million kilowatts (including industrial and railway power, etc.). Premier Khrushchev expects to install 60 million kilowatts more capacity within eight years, while the increase for the U. S. may be estimated at around 125 million, including industrial plants. On this basis, by 1965 Russia's ratio would increase to around 40 per cent. On the basis of electric output Khrushchev thinks his plants can produce 510 billion kilowatt-hours in 1965 when U. S. plants might be producing as much as 1,250 billion kilowatt-hours—a ratio of about 41 per cent.

A breakdown of the Russian figures by *use* of the output would be interesting—it seems almost certain that Russian residential use is far less than ours—and presumably the proportion used for the war effort is much larger than in the U. S. However, no data on this seem to be available.

On an overall basis Soviet output per capita is only about one-quarter of that in the United States, and measured by this ratio alone it is about twenty years behind the U. S. (See chart, page 120.)

DATA ON ELECTRIC UTILITY STOCKS

Annual Rev. (Mill.)			12/23/58 Price About	Dividend Rate	Approx. Yield	Recent Share Earns.	% Increase	Aver. Incr. In Sh. Earns. 1952–57	Price-Earn. Ratio	Div. Payout	Approx. Common Stock Equity
$284	S	American Elec. Power	54	$1.68	3.1%	$2.24Oc	3%	9%	24.1	75%	33%
50	O	Arizona Public Service	42	1.20	2.9	*1.89Se	2	7	*22.2	63	27
11	O	Arkansas Mo. Power	23	1.00	4.3	1.34Se	3	2	17.2	75	32
32	S	Atlantic City Electric	40	1.50	3.8	1.89N	7	10	21.2	79	28
142	S	Baltimore Gas & Elec.	44	1.80	4.1	2.30Se	1	6	19.1	78	43
7	O	Bangor Hydro-Elec.	36	1.90	5.3	2.24Se	D10	4	16.1	85	36
6	O	Black Hills P. & L.	31	1.44	4.6	2.42Oc	15	3	12.8	60	30
104	S	Boston Edison	58	2.80	4.8	3.12De	D10	—	18.6	90	47
24	A	Calif. Elec. Power	21	.80	3.8	*1.09Se	—	1	*19.3	73	28
23	O	Calif. Oreg. Power	35	1.60	4.6	1.91F	D16	2	18.3	84	35
8	O	Calif. Pac. Util.	32	1.60	5.0	2.35Oc	7	3	13.6	68	30
67	S	Carolina P. & L.	38	1.32	3.5	2.01N	10	4	18.9	66	40
30	S	Cent. Hudson G. & E.	19	.80	4.2	1.17Se	14	6	16.2	68	31
23	O	Cent. Ill. E. & G.	36	1.44	4.0	2.03Oc	7	11	17.7	71	36
37	S	Cent. Ill. Light	33	1.40	4.2	2.00N	D1	9	16.5	70	34
53	S	Cent. Ill. P. S.	42	1.68	4.0	2.57Se	8	13	16.3	65	40
15	O	Cent. Louisiana Elec.	51	1.80	3.5	2.26Se	8	8	22.6	80	30
38	O	Cent. Maine Power	25	1.40	5.6	*1.70N	D8	5	*14.7	82	32
137	S	Cent. & South West	57	1.70	3.0	2.50Se	7	10	22.8	68	40
12	O	Cent. Vermont P. S.	22	1.00	4.5	*1.29Se	37	2	*17.1	77	33
121	S	Cincinnati G. & E.	35	1.50	4.3	1.95Se	—	9	17.9	77	39
7	O	Citizens Util. "B"†	23	1.00	4.3	1.25Se	7	7	18.4	80	40

Annual Rev. (Mill.)		(Continued)	12/23/58 Price About	Dividend Rate	Approx. Yield	Recent Share Earns.	% Increase	Aver. Incr. In Sh. Earns. 1952–57	Price-Earn. Ratio	Div. Payout	Approx. Common Stock Equity
119	S	Cleve. Elec. Illum.	51	1.60	3.1	2.56Se	—	6	19.9	63	50
5	O	Colo. Cent. Power	37	1.32	3.6	1.94Se	17	4	19.1	68	41
44	S	Columbus & S. O. E.	36	1.60	4.4	2.01N	D23	5	17.9	80	30
380	S	Commonwealth Ed.	54	2.00h	5.7h	3.10Oc	7	5	17.4	65	40
13	A	Community Pub. Service ..	37	1.30	3.5	1.98Se	3	6	18.7	66	45
75	O	Conn. Lt. & Pr.	24	1.10	4.6	*1.40N	17	5	*17.1	79	34
582	S	Consol. Edison	62	2.80	4.5	*3.62Se	10	6	*17.1	77	38
221	S	Consumers Power	54	2.40	4.4	3.13N	D4	5	17.3	77	37
78	S	Dayton P. & L.	52	2.40	4.6	3.33Se	8	2	15.6	72	38
49	S	Delaware P. & L.	61	2.10	3.4	2.81Se	1	12	21.7	75	30
251	S	Detroit Edison	42	2.00	4.8	2.14Oc	D19	11	19.6	93	44
136	A	Duke Power	50	1.60i	3.2	2.38Se	15	15	21.1	67	47
99	S	Duquesne Light	48	2.20	4.6	*2.84Se	6	4	*16.9	77	34
32	O	East. Util. Assoc.	39	2.20	5.6	2.65Se	13	0	14.7	83	34
2	O	Edison Sault Elec.	17	.80	4.7	1.13Se	D5	24	15.0	71	33
14	O	El Paso Elec.	35	1.00	2.9	1.57Oc	13	9	22.3	63	36
12	S	Empire Dist. Elec.	24	1.20	5.0	1.52Se	D2	3	15.8	79	32
52	S	Florida Power Corp.	30	.72	2.4	1.22Se	37	13	24.6	59	34
131	S	Florida P. & L.	89	1.64	1.8	3.45Se	16	22	25.8	47	39
202	S	General Pub. Util.	50	2.12	4.2	*3.32Se	10	9	*15.1	64	41
7	O	Green Mt. Power	20	1.00	5.0	1.30Se	10	7	15.4	77	36
62	S	Gulf States Util.	55	1.80	3.3	2.39Oc	4	11	23.0	75	31
49	A	Hartford E. L.	63	3.00	4.8	*4.41Se	9	10	*14.3	68	39
24	O	Hawaiian Elec.	49	2.50	5.1	2.93Se	D3	12	18.1	85	37
87	S	Houston L. & P.	71	1.60	2.3	2.99Oc	11	11	23.7	55	42
28	S	Idaho Power	48	1.60	3.3	2.60Se	13	12	18.5	62	36
87	S	Illinois Power	37	1.50	4.1	2.06Oc	10	7	18.0	73	34
46	S	Indianapolis P. & L.	36	1.50	4.2	2.12Se	3	7	17.0	70	35
26	S	Interstate Power	18	.85	4.7	1.08Se	3	2	16.7	79	31
36	S	Iowa Elec. L. & P.	34	1.60	4.1	2.09Oc	4	5	16.3	77	38
41	S	Iowa-Ill. G. & E.	37	1.80c	4.9	2.41Se	D7	3	15.4	75	38
39	S	Iowa Power & Light	34	1.60	4.7	1.94Se	D6	4	17.5	82	30
34	O	Iowa Pub. Serv.	18	.80	4.4	1.14N	3	8	15.8	70	35
14	O	Iowa South. Util.	28	1.28	4.6	1.97Oc	10	5	14.2	65	40
61	S	Kansas City P. & L.	50	2.00	4.0	3.06Oc	4	7	16.3	62	37
32	S	Kansas G. & E.	41	1.48	3.6	2.50N	8	13	16.4	59	30
48	S	Kansas Pr. & Lt.	28	1.36	4.9	2.00Se	D4	7	14.0	68	31
39	O	Kentucky Util.	35	1.40	4.0	2.36Se	15	3	14.8	60	36
7	O	Lake Superior D. P.	24	1.20	5.0	1.57Se	D2	3	15.3	76	39
110	S	Long Island Lighting	30	1.20	4.0	1.62Se	14	5	18.5	74	34
56	S	Louisville G. & E.	44	1.20	2.7	2.22Se	31	3	19.8	54	41
10	O	Madison G. & E.	49	1.80	3.7	3.46Se	D19	11	14.2	52	44
5	A	Maine Pub. Service	23	1.16	5.0	1.52Oc	D1	7	15.1	76	37
6	O	Michigan G. & E.	61	1.70j	5.8	4.51Se	12	8	13.5	38	40
172	S	Middle South Util.	47	1.80	3.8	2.60Oc	3	6	18.1	70	35
30	S	Minnesota P. & L.	34	1.60	4.7	2.22N	D14	11	15.3	72	33
3	O	Miss. Valley P. S.	28	1.40	5.0	2.16Oc	—	3	13.0	65	32
13	S	Missouri Pub. Serv.	19	.72f	3.8	.92N	D10	9	20.7	78	29
7	O	Missouri Util.	26	1.36	5.2	1.64Se	D11	3	15.9	83	33
44	S	Montana Power	70	2.00	2.9	*3.86Se	4	8	*18.1	52	39
159	S	New England Elec.	19	1.00	5.3	1.21Se	3	0	15.7	83	34
46	O	New Englnad G. & E.	21	1.10	5.2	1.54Oc	5	5	13.6	71	41
49	O	New Orleans P. S.	48	2.25	4.7	3.22Oc	13	0	14.7	70	39
3	O	Newport Electric	20	1.10	5.5	1.44Oc	37	—	13.9	76	31
89	S	N. Y. State E. & G.	55	2.00	3.6	*3.76Oc	24	6	*14.6	53	37
255	S	Niagara Mohawk Power ..	38	1.80	4.7	*2.15Oc	18	—	*17.7	84	28
87	O	Northern Ind. P. S.	47	2.00	4.3	2.76Se	D7	6	17.0	72	37
148	S	Nor. States Power	22	1.00	4.5	1.29Se	7	4	17.1	77	33
10	O	Northwestern P. S.	20	1.00	5.0	1.43Se	7	0	14.0	70	27
136	S	Ohio Edison	59	2.64	4.5	3.59N	D1	5	16.4	74	41
50	S	Oklahoma G. & E.	28	1.00	3.6	1.44Oc	17	5	19.4	69	30
21	O	Orange & Rockland Utils. .	22	.90	4.1	*1.12Ma	NC	15	*19.6	80	26
16	O	Otter Tail Power	31	1.60	5.2	2.24Oc	—	1	13.8	71	29
501	S	Pacific G. & E.	61	2.60	4.3	3.63Se	NC	10	16.8	72	34

Annual Rev. (Mill.)		(Continued)	12/23/58 Price About	Dividend Rate	Approx. Yield	Recent Share Earns.	% Increase	Aver. Incr. In Sh. Earns. 1952–57	Price-Earn. Ratio	Div. Pay-out	Approx. Common Stock Equity
50	O	Pacific P. & L.	39	1.60	4.1	*2.39Se	NC	5	*16.3	67	28
129	S	Penn Power & Lt.	57	2.50	4.4	3.16Oc	D4	9	18.0	79	30
236	S	Phila. Elec.	47	2.00	4.3	*2.76Se	10	4	*17.0	72	39
36	O	Portland Gen. Elec.	28	1.20	4.3	1.67Oc	D2	8	16.8	72	37
69	S	Potomac Elec. Pr.	28	1.20	4.3	*1.55Se	NC	3	*18.0	77	32
91	S	Pub. Serv. of Colo.	49	1.90k	3.9	2.46Se	D13	7	20.0	77	36
322	S	Pub. Serv. E. & G.	38	1.80	4.7	2.23Se	5	3	17.0	82	34
79	S	Pub. Serv. of Ind.	44	2.10	4.8	2.81Se	6	3	15.7	75	38
32	O	Pub. Serv. of N. H.	18	1.00	5.6	1.23N	D10	6	14.6	81	36
13	O	Pub. Serv. of N. M.	26	.80g	3.1	1.32Se	15	8	19.7	61	35
27	S	Puget Sound P. & L.	33	1.44	4.4	*1.92Se	8	16	*17.2	75	50
60	S	Rochester G. & E.	39	1.60	4.1	2.45Se	10	2	15.9	65	32
8	S	St. Joseph L. & P.	31	1.50	4.8	1.90Se	D6	8	16.3	80	32
54	S	San Diego G. & E.	26	.96	3.7	1.25Oc	D11	D	20.8	77	36
10	O	Savannah E. & P.	29	1.00	3.4	1.49Oc	11	25	19.5	67	30
10	O	Sierra Pacific Pr.	32	1.40	4.4	2.01Oc	D3	12	15.9	70	30
217	S	So. Calif. Edison	60	2.60	4.3	3.51Se	14	D	17.1	74	33
46	S	So. Carolina E. & G.	34	1.20	3.5	1.85Se	24	15	18.4	65	35
7	O	Southern Colo. Pr.	20	.90	4.5	1.48Au	13	8	13.5	61	38
255	S	Southern Co.	37	1.20	3.2	1.78Se	13	8	20.8	67	32
19	S	So. Indiana G. & E.	34	1.60	4.1	2.43Oc	6	2	14.0	66	37
7	O	So. Nevada Power	26	1.00	3.8	1.49Oc	D3	9	17.4	67	40
3	O	Southwestern E. S.	16	.64	4.0	.95N	7	6	16.8	67	27
44	S	Southwestern P. S.	39	1.48	3.8	1.75Se	D3	3	22.2	85	36
30	A	Tampa Elec.	44	1.20	2.7	1.70Oc	3	11	25.9	70	35
155	S	Texas Utilities	65	1.76	2.7	2.70Se	6	13	24.0	65	40
42	S	Toledo Edison	16	.70	4.4	1.10Se	11	—	14.5	64	31
16	O	Tucson G. E. L. & P.	54	1.52	2.8	2.43Se	11	15	22.2	63	35
129	S	Union Elec. of Mo.	32	1.52	4.8	*1.66Se	D1	7	*19.3	92	32
36	O	United Illuminating	28	1.60	5.7	1.61Au	6	2	17.4	100	48
6	O	Upper Peninsula Pr.	30	1.60	5.3	1.64Se	D16	8	18.3	97	31
43	S	Utah Power & Light	35	1.20	3.4	1.75Oc	D1	8	20.0	70	42
130	S	Virginia E. & P.	40	1.10	2.8	1.63Se	11	15	24.5	67	37
31	S	Wash. Water Pr.	43	2.00	4.7	*2.30N	D6	9	*18.7	87	36
140	S	West Penn Elec.	36	1.50	4.2	2.25Oc	4	6	16.0	67	32
77	O	West Penn Power	54	2.40	4.4	3.27Se	D1	6	16.5	73	36
12	O	Western Lt. & Tel.	39	2.00	5.1	2.78Oc	D4	7	14.0	72	38
28	O	Western Mass. Cos.	47	2.20	4.7	3.30Oc	2	8	14.2	66	49
114	S	Wisc. Elec. Pr. (Cons.) ..	37	1.60	4.3	2.20Se	D11	0	16.8	73	36
43	O	Wisconsin P. & L.	32	1.36	4.3	1.97Se	—	4	16.2	69	40
40	S	Wisconsin P. S.	25	1.20	4.8	1.73Se	D5	5	14.5	69	38
		Averages			4.2%		4%	7%	17.6	72%	
		Foreign Companies									
215	S	Amer. & Foreign Power ..	17	$1.00	6.3%	$2.16Je	27%	0	7.4	46%	44%
170	A	Brazilian Traction	6	.53a	9.0	1.52De	D30	0	3.9	35	75
75	A	British Col. Pr.	37	1.40	3.8	2.33De	—	15%	15.9	60	28
18	A	Gatineau Power	38	1.50	3.9	2.39De	5	10	15.9	63	33
42	O	Mexican L. & P.	14	1.00b	7.1	1.96De	17	24	7.1	51	46
14	A	Quebec Power	36	1.60	4.4	2.17De	8	14	16.6	74	53
63	A	Shawinigan Water & Pr. ..	35	.68	1.9	1.48De	5	26	23.6	46	37

*Deferred taxes resulting from liberalized depreciation are not normalized. If normalized, the price-earnings ratio would be higher. **On average shares. †Stock dividends (only) are paid on the "A" shares. D—Decrease. NC—Not comparable. A—American Stock Exchange. O—Over-counter or out-of-town exchange. S—New York Stock Exchange. Ja—January; F—February; Ma—March; Ap—April; My—May; Je—June; Jy—July; Au—August; Se—September; Oc—October; N—November; De—December. a—Also 5 per cent stock dividend December 27, 1957. b—Also 5 per cent stock dividend May 1, 1958. c—Also 5 per cent stock dividend March 10, 1958. f—Also stock dividend of one-half per cent quarterly. g—Also 5 per cent stock dividend July 1, 1958. h—Also 2 per cent stock dividend November 20, 1958, included in the yield. i—Also 15 per cent stock dividend (subject to approval). j—Also 3 per cent stock dividend (paid each year end) included in yield. k—Also 5 per cent stock dividend payable February 20, 1959.

What Others Think

Financing Electric Utility Expansion

THE investment of all investor-owned electric utilities in the United States in gross plant for not only electric but all collateral services increased a net of $24,-252 million in the eleven years ended with 1957, while gross outlays for construction in the same period totaled $27,057 million. At the close of 1957, total capability of all electric systems in the country contributing to the public supply (investor-owned, federal, and nonfederal public plants) was 130,630,000 kilowatts, an increase of 6.5 per cent above that of a year earlier.

According to the April 1, 1958, estimate of the electric power survey committee of Edison Electric Institute, more than 49.7 million kilowatts of capability must be added during the 1958-61 years to satisfy the anticipated electric requirements of ultimate consumers in 1961 and orders for this equipment have already been placed with manufacturers, or negotiations have proceeded to the point where its purchase and installation is assured. Of this added capability, nearly 38.2 million kilowatts or 77 per cent will be installed by investor-owned utilities and the balance by federal and other government-owned systems. This proposes the question: Can the investor-owned electric utilities of the country raise the capital with which to pay for this vast expansion?

In his address before the twenty-sixth annual convention of Edison Electric Institute on June 9, 1958, Ralph J. Cordiner, board chairman of General Electric Company, said that the electric supply systems of the country would have to buy $1.25 trillion of equipment during the next score of years to meet public electric demands at the end of that period. Then, apparently wondering how they could, and if they could, raise the necessary funds, he made some exceedingly pertinent remarks, which drew the sharp attention of the investment banking fraternity, whose job it will be to distribute the necessary securities to institutional and other private investors.

WHILE his complete remarks are published in the June, 1958, *Bulletin* of EEI, some of them will be included here for the benefit of those who did not read his full address.

"During the past half-century, research and engineering have combined to produce turbine-generator systems that, on the average, use only about one-eighth as much coal per kilowatt-hour as did those first turbines which edged reciprocating steam engines right out of the picture. These improvements, toward which the entire electrical industry has contributed, have made electricity the American consumer's biggest bargain.

"Over these fifty years, the reduction in fuel consumption per kilowatt-hour has averaged about 3 per cent a year, compounded annually. During the period 1950 to 1955, the rate of improvement rose to a remarkable 5 per cent a year, due mainly to a rapid increase in the average temperature, pressure, and size of units installed. Technically, however, it appears that genuine limits are being reached in what can be done with the available metals. Until some new basic knowledge is discovered, it appears that the increments of improvement in turbine-generator technology may be considerably smaller in the years ahead for those utilities that are already operating the largest-size machines. The company's scientists and engineers estimate that a reduction in fuel consumption per kilowatt-hour of perhaps 1 per cent to 1.5 per cent a year is the best that can be expected in the next ten years, on the average.

"THERE are, of course, many utility companies which still have the opportunity of making rapid progress by installing the larger machines already available, and turbine-generators rated from 500,000 to 750,000 kilowatts will come into use in the 1960's. Increased interconnection and the trend to joint purchase and use of high-capacity machines, by several companies, will produce further advances in system economy." Then came his punch line.

"On a nation-wide basis, however, the advances in generating efficiency are not going to be enough to offset the inflation in your production costs, to anything like the degree that has existed in recent years. This leads to two clear conclusions: (1) Unless the basic inflationary trend is halted, the health of your business and our business—indeed, the health of the nation's economy—*may depend on winning public understanding of the need for a realistic reappraisal of the appropriate selling price for electricity.* (Italics supplied.) (2) As never before, the electrical industry must assure tomorrow's progress by continuing its vigorous exploration of scientific opportunity and exploitation of technological gains."

THERE are a number of methods of indicating the inadequacy of the present selling price of electricity and the impact of this inadequacy on the ability of investor-owned electric utilities to attract expansion funds. Federal and government-owned electric systems are not faced with this difficulty, since they are subsidized by the taxpayers and the income from securities they sell is exempt from federal income taxes. One of the serious problems confronting investor-owned electric systems today is the decline in the volume of expansion funds investor-owned electric utilities are able to generate internally.

During the 11-year 1947-57 period, when gross plant account for facilities to render not only electric but collateral services rose $24,252 million and gross outlays for expansion and retirement of debt rose $27,057 million, visible funds available to investor-owned electric utilities totaled $31,183.5 million, of which $11,842 million or 37.97 per cent was produced internally and $19,341.5 million or 62.03 per cent was derived from the sale of securities. However, due to mounting costs of labor, materials, and supplies, not only has the proportion of expansion capital that can be generated internally varied, but actually declined in 1957 from the preceding year.

FROM a low of 18.6 per cent in 1949 and a high of 47 per cent in 1956, internally produced construction funds dropped

to 36.1 per cent in 1957. Moreover, unless a general decline in wages and the prices of materials and supplies sets in in the very near future, it would appear that the proportion of internally produced construction funds will continue to decline at the present level of rates. It would appear that interest on debt money can be paid under any foreseeable conditions and that preferred stock dividends can be met. But the plight of the common stockholder, who has the last claim on earnings, would appear to be worsening. Operating revenues in 1957 were 269 per cent above 1937, gross income; the balance of revenues available for capital hire was up nearly 64 per cent; due largely to lower interest rates, the balance available to preferred stockholders was up almost 100.2 per cent, while the balance of earnings available for common stock dividends rose only 132.9 per cent.

THE major reasons for the present plight of investor-owned electric utilities are that they have been too efficient and have passed too much of the benefits of their efficiency along to their cash customers. The wages of the money invested in their facilities exert their demands during the 8,760 hours of a normal year, while demands for electricity are made during only a portion of those hours, since most folks sleep during hours of darkness when lights are needed most, and many industries and most stores are closed at night.

Nevertheless, compared with the theoretical maximum output of electric energy per kilowatt of capability, the average rate of production per kilowatt rose from 3,364 kilowatt-hours in 1937, or 38.65 per cent of the maximum, to 5,056 kilowatt-hours in 1947, or 57.72 per cent, to 5,105 kilowatt-hours, or 58.53 per cent of the maximum, in 1957. But in an attempt to combat the subsidized rates of federal power projects, investor-owned electric systems continued to reduce their rates. Where the average realization per kilowatt-hour sold in 1937 to all consumers was 2.17 cents, it had dropped to 1.67 cents in 1957, or by 23.04 per cent. Where the average price paid by residential consumers in 1937 was 4.30 cents per kilowatt-hour, it had dropped to 2.56 cents in 1957, or by 40.67 per cent. Where the rate to commercial consumers in 1937 averaged 3.41 cents per kilowatt-hour, it had declined 29.03 per cent to 2.42 cents in 1957. And where the average cost to industrial consumers was 1.41 cents per kilowatt-hour in 1937, it had dropped to 0.92 cents by 1957, or by 10.53 per cent. With the price of bread and butter, milk and transportation steadily rising during this period, these sharp declines in the price of electricity are unjustified, economically, and it is time they were corrected.

ALTHOUGH the number of ultimate consumers served by investor-owned electric utilities increased by 6,331,000, on the average, during the five years ended

TABLE I
PROPORTIONS OF OPERATING REVENUES AVAILABLE FOR CAPITAL HIRE IN SELECTED YEARS

Years	*1937*	*1942*	*1947*	*1952*	*1957*
Gross Income*	39.31%	29.56%	20.21%	27.09%	17.46%
Net Income**	23.81	18.07	15.29	14.51	12.92
Net Earnings***	17.92	13.87	14.91	14.19	11.31

*Available for all capital hire.
**Available for preferred dividends.
***Available for dividends on the common stock.

with 1957, or 16.72 per cent, and energy sales rose by 146,846 million kilowatt-hours or 52.12 per cent during the same years, investors in their securities, and especially their common stockholders, did not benefit to the same extent. Part of this was due to the sales of added securities to engage funds for plant expansion. During the five years 1947-53, these utilities sold a total of $9,302 million of issues, of which $1,953 million or 21.1 per cent was common stock, $1,018 million or 10.9 per cent was preferred stock, and the balance of $6,331 million, or roughly 68 per cent, was long-term debt issues. During the five-year period, the amount of common stock outstanding rose 61.92 per cent, preferred stock was up 62.41 per cent, and long-term debt rose 99.4 per cent.

Unfortunately, the inflationary impact on operating expenses resulted in continued increases, with the result that the balance of operating revenues available for the hire of capital continued to drop during the period from 1937 through 1957. Where 39.31 per cent of 1937 operating revenues was carried down to gross income for the reward of capital, only 17.46 per cent was available for capital hire in 1957. These and other proportions are shown in Table I, page 118.

As previously stated, the volume of income available for interest on debt issues is still adequate, although coverage of fixed charges is declining. Likewise, because of the small outstanding volume, net income available for preferred dividends is more than adequate. But net earnings for the payment of dividends on the common stock is getting pretty "thin" and investor-owned electric utilities may find difficulty over the next score of years in keeping their capitalization ratios in line through the sale of additional common stock in the financing of their expansion programs.

With little hope of reducing such operating costs as wages and prices of fuel, materials, and supplies in the immediate future, about the only way investor-owned electric utilities can attract the expansion capital they will need is through higher rates to increase the dollar volume of net earnings for their common stocks.

Obviously, not only will such an attempt meet with violent opposition from government ownership advocates, but it will require time to sell the idea to ultimate consumers and regulatory agencies. Accordingly, no time should be lost in starting a campaign to sell this idea to the consuming public. Moreover, as a result of the November elections, the task can be expected to meet with political opposition.

E.R.A.

The Electric Industry's Record in 1958

Outstanding among the encouraging influences during the 1957-58 recession were the stability and progress of the electric utility industry, J. E. Corette, president of Edison Electric Institute, reported in a year-end review. While industrial production, as measured by the Federal Reserve Board, declined over 19 points, electric production more than held its own. Generation by all components in the industry totaled 641 billion kilowatt-hours, an increase of 10 billion kilowatt-hours over 1957. Railway and industrial generation declined slightly in 1958, however, so when combined output of these plants is added to that of the electric industry, total electric production for the nation in 1958 reaches 721 billion kilowatt-hours. This exceeds last year's figure by 5 billion kilowatt- hours.

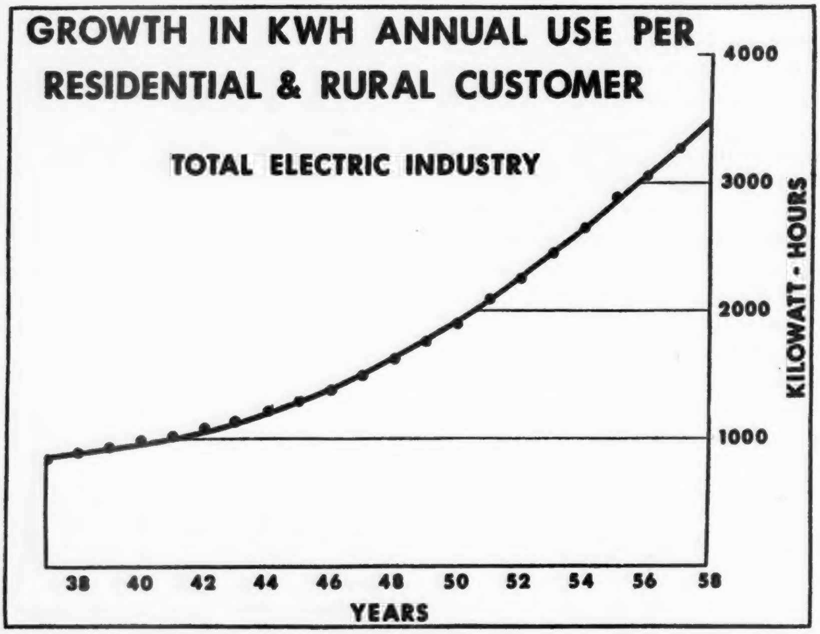


CHART 1

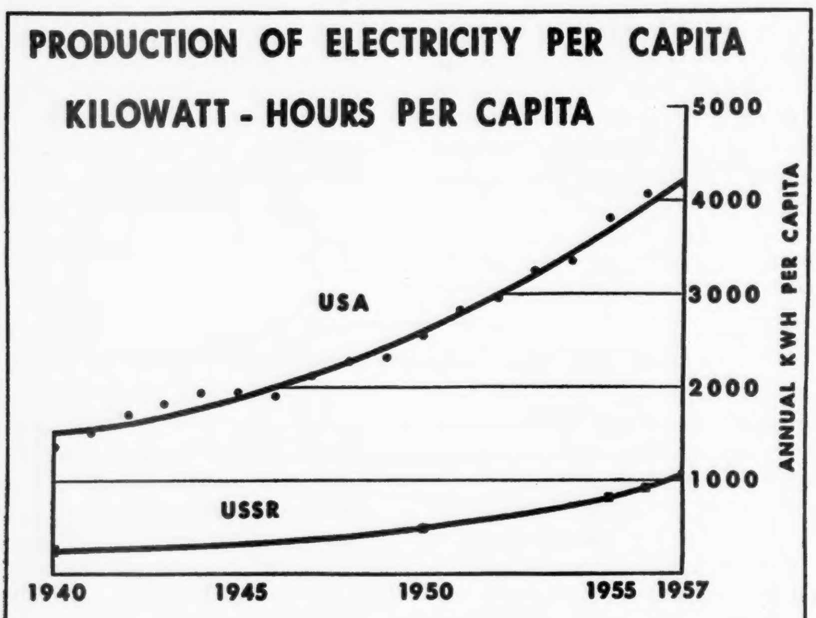


CHART 2

Corette, who is also president of the Montana Power Company, noted that the electric industry has some built-in stabilizers, the most prominent being constantly increasing residential use per customer and the constant increase in number of customers. In 1958 average annual usage of electricity per domestic customer reached another new high of 3, 385 kilowatt-hours. This represents an increase of 211 kilowatt-hours over last year. The striking long-term growth in this sector of electricity consumption in the U.S.A. is plotted in Chart 1 (page 120), which shows average annual usage by rural and residential customers since 1937. The persistent and consistent way home kilowatt-hour consumption has increased, during all phases of business activity, is striking, Corette said.

The electric industry added another million customers in 1958, bringing the total at year end to 56.2 million. Over 85 per cent of these additional customers are residential. This is an accurate reflection of the growth of the nation. Population estimates predict a figure of over 200 million persons in less than ten years hence. These new citizens, as well as those of us presently here, will create still greater demands for all products, including electricity. Corette said the electric industry expects residential demand to keep to its current trend, and use of from 6,000 to 8,000 kilowatt-hours per domestic consumer per year by 1968 is not an idle speculation.

BECAUSE of the three years' "lead time" required to get new power-producing facilities ready for use, the electric industry must plan well ahead of customer demand, Corette emphasized. Temporary business declines cannot cloud the industry's long-term vision. In 1958, for example, the investor-owned companies spent $3.8 billion on new plant and equipment investment, an increase of $100 million over the 1957 record high. With total business investment (all industries) declining in 1958, from $37 to $31 billion, the investor-owned electric companies' confidence in the nation's future greatly helped to prop up this key component in the overall economy.

Electric plant investment equaled 12.5 per cent, or one-eighth, of all business investment in 1958. In 1958 the electric industry made the largest annual single increase in generating capability in the industry's history.

FOURTEEN million kilowatts of new generating equipment came on the line in 1958, Corette reported. Of this amount 11.5 million kilowatts were added by the investor-owned electric companies and the remainder by governmental agencies. The new additions increased America's electric utility generating capability to 149.5 million kilowatts at year-end 1958. By way of comparison, more kilowatts of generating capability were added than the industry had in operation in 1920, or again, 1958's additions approximate the amount added from 1945 to 1949, a period of five years. Said Corette:

> The electric industry expects to keep right on adding to America's power supply. Construction expenditures by electric companies in 1959 are expected to equal the $3.8 billion expended in 1958 on new plant and equipment. About 13.6 million more kilowatts of capability will be brought into service in 1959; 10.2 million by the companies, and 3.4 million by governmental agencies. In ten years the electric industry is expected to be adding over 20 million kilowatts a year just to keep abreast of a consumer demand estimated at 1,300

billion kilowatt-hours for the year 1968.

During the recession, total corporate profits of all industries suffered one of the sharpest declines in history—dropping 30 per cent. However, earnings of the nation's investor-owned electric companies as a whole were better than in 1957. Gross revenues in 1958 were $8,416 million; in 1957 they were $8,054 million. Net income was $1,534 million in 1958 *versus* $1,427 million in 1957.

A growth industry, such as the electric industry, with considerable insulation from the fluctuations of the business cycle, is important to investors—of which there are presently nearly four million—to employees and to customers.

DURING the recent business decline, compensation to all employees in all industries fell off about 2 per cent. But in the electric utility industry wage and salary compensation ran up from $1,426 million in 1957 to $1,490 million in 1958, an increase of almost 5 per cent. Steady jobs at good pay is an important factor in retaining the reliable and dedicated personnel necessary in the electric industry.

Fuel, another important expense, cost power companies $1,365 million in 1958, a 1.2 per cent decrease from 1957. Due to favorable water conditions throughout the country, hydro generation accounted for a larger share of total electric utility generation. In 1957, falling water sources generated 20.6 per cent of the total, whereas in 1958 hydro generation was estimated at 22.1 per cent of the total.

Investor-owned electric companies will pay approximately $2 billion in taxes for 1958, up over the previous year's total by nearly $150 million, Corette reported. These payments to all levels of government, federal, state, and local, represent a fantastic figure when it is considered that an equal amount was paid by all the 48 state governments for unemployment benefits to more than 3.5 million unemployed workers during the year.

"One of the reasons behind the anticipated $12.5 billion federal deficit this year is the lower tax payments from recession-hit corporations," Corette said. "Had utility net income decreased, the federal deficit would be even higher. Considering the plight of government finances, it appears not only discriminatory but irresponsible to continue the preferred tax position of government-owned and government-financed power projects. Customers of government power, as more and more people are beginning to realize, do not pay their fair share of our national tax burden."

DESPITE the recession, the Consumers' Price Index moved to a high of 123.9 in July, 1958 (1947-49 = 100). In contrast, the average revenue per kilowatt-hour sold to domestic customers maintained its steady decline. In 1958 average revenue was 2.52 cents, down from 2.56 cents in the previous year. Increased consumption, the promotional character of electric rates, as well as operating efficiencies, have all contributed to this enviable record.

Latest available figures show that of each dollar spent by consumers, only 1.32 cents went for electricity, whereas 2.13 cents were spent for tobacco, 3 cents for gasoline, and 5.18 for recreation. Corette continued:

> Regulatory commissions continue to recognize the inflationary inroads on practically all aspects of operational and capital costs, and the necessity for the financial strength essential to the provision of adequate electric service.
>
> From 1946 through the first eleven months of 1958, according to tabulations of the Edison Electric Institute,

there were 542 applications for rate increases, involving 220 companies. Of the 542 applications, 476 were granted, 32 are pending, 13 were withdrawn, and 21 denied. The 1958 record to December 1st shows 58 actions. Thirty increases were granted, 27 of the 1958 applications are still pending, and one was denied.

THE Edison Electric Institute Board of Directors in 1958 approved an institute-sponsored National Electrical Living Program aimed at further increasing the home use of electricity. Approximately two-thirds of the institute's member companies are already participating in this promotional enterprise with some $2.5 million pledged for the 1959 program, which will be launched during National Electrical Week, February 8th to 14th.

The program is designed to represent a rallying point for manufacturers and other trade allies in the electrical field to concentrate and co-ordinate their selling efforts in the residential market. EEI plans to use national television, newspapers, magazines, and other media in carrying out this new program. With this basic activity, strongly supplemented by the integrated advertising and promotion efforts of electrical manufacturers and others, the industry expects to achieve a new effectiveness in selling electrical living at both national and local levels.

The electric utility industry in 1958 continued its substantial efforts to hasten the day when economic electricity from nuclear fuels can be produced. One of the most significant steps toward this goal was the formation in November of the largest nuclear power group in the United States—High Temperature Reactor Development Associates, Inc. Composed of Philadelphia Electric Company and more than 50 other electric utility companies, HTRDA has offered to develop and build a high-temperature, gas-cooled nuclear power plant which may provide a short cut to the goal of economic nuclear power.

Philadelphia Electric Company and HTRDA will spend $24.5 million to construct the 40,000-kilowatt prototype plant which would be completed in 1962 or early in 1963.

Construction and operation of such a plant was viewed by the electric industry as an important step toward the achievement of economically competitive atomic power.

In addition to being the largest nuclear group in the United States, HTRDA is the most widely representative group of U. S. utility companies to support a single nuclear power project thus far.

ONE hundred twenty-nine electric utility companies, serving most of the nation's consumers, were participating in one or more of 28 nuclear power research, development, and construction projects or studies at the end of 1958.

Late in 1957, the world's first full-scale atomic power plant devoted exclusively to peaceful uses went into operation at Shippingport, Pennsylvania, and early in 1958 the plant was developing more than 60,000 kilowatts of power for the city of Pittsburgh. Its ultimate capacity will be even greater.

Since 1954 when Congress passed a new Atomic Energy Act which permitted industry to develop and construct its own nuclear power plants, electric power companies have embarked on a substantial number of nuclear projects. This expanding program, carried on in co-operation with the manufacturers and AEC, at present includes 16 announced nuclear power plant construction projects involving a total utility company investment of more

than $540 million. There are also 12 other nuclear research, development, and study projects calling for continuing expenditures of additional sums of money. One research program is a multimillion-dollar project in the field of controlled thermonuclear (fusion) reaction.

Of the 16 nuclear power construction projects, three are now in operation, producing power being utilized on company systems. Another six projects are either under construction or contract, while the remaining seven are in various planning stages.

In spite of Russian claims, Soviet total electric generating capacity is less than the total of new capacity installed in 1958 and to be installed in the next three years by the U. S. electric industry, Corette said.

The total installed capacity in the U.S.S.R. as reported by the Soviet Power Ministry was 48.3 million kilowatts at the end of 1957. During the four years, 1958, 1959, 1960, and 1961, the United States will install a total of more than 50 million kilowatts of new capacity.

Premier Khrushchev announced in November that the Soviet government expects annual Russian output of electric power to reach 500 to 520 billion kilowatt-hours in 1965. By the same year, United States output is expected to reach 1¼ *trillion* kilowatt-hours annually. "In considering a comparison of this kind, it should be recognized that the Russians have a history of consistency in failing to reach goals such as they have set in electric power, while in the U. S., the electric industry has a long-established record of making carefully considered predictions and then exceeding them in actual growth," Corette said.

In electric generating capacity, the Soviet Union has announced plans for adding 60 million kilowatts by 1965. The total to be reached by that year would be 108 million kilowatts for Russia, if its expectations are met. This compares with an estimated 250 million kilowatts which the United States will have installed by 1965.

The Soviet Union plans to add an average of about 7.5 million kilowatts of capacity a year to 1965. During the same period, the United States will be adding an average of over 14 million kilowatts annually.

Total electric sales per capita in the U. S. in 1957 were four times those of the U.S.S.R., but residential and rural sales per capita were six times those of Russia.

In 1957, the United States generated about 4,180 kilowatt-hours of electricity per capita. Russian per capita production in the same year was 1,045 kilowatt-hours. Soviet output per capita now is about where the United States was in 1938—some twenty years behind. (See Chart 2, page 120.)

"IN a great and powerful country the effects of pernicious taxation do not reveal themselves suddenly, and when they do show forth they are often attributed to the wrong cause. Taxation and its bastard child inflation are responsible for the depression from which we are slowly emerging. People like to say that the depression was caused by the wage-price spiral, but what caused the spiral if not the taxes and government spending? To blame the spiral is like blaming the cough for tuberculosis."

EDITORIAL STATEMENT,
Los Angeles Times.

The March of Events

Quick FPC Action Promised

The Federal Power Commission said it would act promptly to dispose of the big backlog of natural gas rate cases that built up during the time when the so-called "Memphis case" was working its way up to the Supreme Court. The commission also stated that action on any refunds to be made, or rates to be reduced, would be taken as speedily as possible. The Supreme Court ruling on the Memphis case upheld the practice of the FPC of putting higher rate tariff filings into effect, subject to refund, pending further FPC investigation, in those cases where contract customers have generally agreed to superseding tariffs, although not to specific increases.

More than half of the cases still before the FPC involve rate filings made before the lower court ruling was handed down in November, 1957. These cases, the commission declared, will get first priority, because of the large dollar amounts of refunds to which customers may be entitled.

While natural gas companies have more than $225 million in already collected funds that are subject to refund, it is doubtful that the commission will find all of the increases unjustified. Thus the total of all refunds ordered in pending cases will most likely be somewhat less than the $225 million plus what the companies would have had to pay back if the Supreme Court had ruled the other way in the Memphis case.

AEC Overrules Unions

The Atomic Energy Commission has told the Power Reactor Development Company it can continue to build a $75.3 million nuclear power plant near Monroe, Michigan, despite opposition of the United Auto Workers and two other AFL-CIO unions. The unions argued that construction of the plant should be halted until its safety could be proved. The AEC, while rejecting the unions' wishes, did concede that the construction company should furnish periodic reports as work progressed, giving the safety aspects of the project. Moreover, it said the plant would not be licensed to operate until it was definitely shown to be safe.

The new nuclear power plant will produce 100,000 kilowatts of electricity for sale to the Detroit Edison Company.

Piggybacking Poses Rate Questions

Are the low rates charged for piggybacking transportation sufficient to make money for the railroads and the forwarders? They say yes, but the

truckers flatly deny it. Piggybacking is an arrangement under which the railroads offer to carry trailer vans and flatcars either owned or leased by private shippers and forwarders at rates competitive with those charged by over-the-road motor carriers.

Key rates under "Plan IV" piggybacking already have been suspended by the Interstate Commerce Commission. This was done because of sharp protests from truckers. In order to lift the suspension, the rails must either convince the ICC that the rates are fully compensatory, or cast such doubts on the validity of the truckers' protests to the contrary that the commission takes no action at all. In which case the rates are automatically restored.

California

Taxes under Protest

ALMOST $2 million of San Francisco county taxes will be paid under protest by the Pacific Gas and Electric Company and the Southern Pacific utility. According to the companies, the protest stems from the high assessment placed on their property by the State Board of Equalization. While public utility property is assessed at 50 per cent of the market value for tax purposes, private property is assessed on a statewide average of about 23.7 per cent. This difference, the utilities maintain, is unfair and discriminatory.

The PG&E Company in paying its first instalment of 50 per cent—$3,098,959—on 1958-59 county taxes—will protest payment of $1,617,388. And Southern Pacific will pay a total tax of $552,915, of which it will protest $290,833.

Another giant utility, Pacific Telephone & Telegraph Company, will pay its county taxes without protest, but it will lodge a protest before the State Board of Equalization on a statewide basis.

Supreme Court Reverses Decision

BY a 4-to-3 vote, the California supreme court has reversed lower tribunals and held that a public utility must pay the cost of moving facilities in streets to make way for storm drains. Although the dispute only involved a mere $1,622 between the Los Angeles County Flood Control District and Southern California Edison Company, the decision will affect all utilities in numerous vast projects.

The court ruled that when a utility accepts "franchise rights" in public streets, it is subject to an "implied obligation" to move its facilities when asked by public agencies. While admitting it should pay relocation costs, to make way for drains serving streets, Southern California Edison contended that storm drains, serving a greater area, were not a primary use of the streets.

In a dissenting opinion, Justice Jesse W. Carter denounced the majority views as another link in the chain of confusion in the high tribunal's decisions involving police and eminent domain powers of government.

Deferred Tax Stand

UNLESS utility companies are permitted to use money from deferred taxes for planned expansions, they will be forced to raise new funds which would add to their rates, the California Public Utilities Commission was told recently.

At a hearing on the accelerated depreciation law, F. Merrill Beatty, an accountant, told the commission that when utilities must seek financing from outside sources such action must be considered

in the setting of new rates. During previous hearings a utility spokesman argued that it was the intent of Congress to allow the utilities to use deferred tax funds for expansion so outside loans would not be necessary.

Colorado

Multimillion-dollar Rate Pact

COLORADO INTERSTATE GAS COMPANY has completed a $38.5 million rate refund agreement with its customers. The agreement covers Interstate's three rate increases for the period from January 1, 1954, through February 4, 1958, and also provides for interest on the refunds through the end of 1958.

Proposals for future rates will be made thirty days after the FPC approves the agreement. These proposals will call for a reduction in Colorado Interstate's present rates. A company spokesman declared that the new rates would mean the Rocky Mountain region would have the lowest wholesale rates for gas than any geographical section of the United States.

Michigan

Attack FPC Gas Supply Cutback

OFFICIALS of the Michigan Consolidated Gas Company are appealing a Federal Power Commission decision that authorizes Panhandle Eastern Pipe Line Company to abandon deliveries to Detroit. They said the FPC order, which directs American Louisiana Pipe Line Company to serve Detroit, starting March 15th, will cost its 850,000 customers an extra $5.4 million a year.

The FPC found that Michigan Consolidated had sufficient unallocated gas available to it from other sources, but that Panhandle's other customers had compelling need for the fuel. In ruling against Michigan Consolidated's argument that the loss of the gas would cost its customers more than $5 million, the FPC stated that the Detroit company "does not have a vested right to the lower-priced Panhandle gas."

American Louisiana Pipe Line Company, Detroit, an affiliate of Michigan Consolidated, has enough extra capacity to supply the latter with enough gas to meet its needs, the FPC decided.

Rate Boost Defended by Chicago Expert

WHEN a Michigan Public Service Commission staff recommended that a request for a $15.3 million rate increase asked for by Consumers Power Company be cut to $4 million, a utility economist was called in to defend the utility's position. Dr. John P. Langham, of Chicago, an Indiana University consultant, said an increase in the amount suggested by the commission would leave earnings below those of comparable utilities in five other states.

Langham's survey showed that Consumers Power electric rates should be boosted at least $14 million a year. The commission's recommendation, he said, would give the utility a 6.13 per cent return on an original cost basis, whereas the average of companies in five states was 6.70 per cent on the same base, and 6.99 per cent on a fair value base.

Company officials declared that the proposed new rates would increase customers' bills an average of four to five cents a day.

Mississippi

Gas Rate Boost Rejected

AN application by United Gas Corporation for a $1,764,000 rate increase has been rejected by the public service commission. Commission Chairman Norman Johnson said the requested rate would have given the company a 32 per cent average boost for all classes of customers in 67 Mississippi cities and towns. The commission found under the old rates the company enjoyed a return in excess of 5 per cent on its investments. Moreover, it was held that employee stock purchase plans, donations, and other costs should not be passed on to the consumer, but to the stockholders of the utility. The decision of the commission requires that United Gas Corporation refund increases in rates collected under bond while the petition was pending. The bonded rates will stay in effect until any appeal by the company is acted upon by the courts.

Nebraska

Study Cost of REA Loan Rate Hike

NEBRASKA'S rural electric districts would pay some $200,000 a year more to operate if interest rates on REA loans are boosted from 2 per cent to 3 per cent. This is the conclusion reached in a study by the Norris Rural Public Power District. A 1 per cent increase in interest of $18.6 million needed for new construction in the next ten years would cost $3.7 million over a 35-year period, the report said. That is for 16 rural districts. With all the districts included—a total of 35—the amount would be about $200,000 annually more than it would at the present 2 per cent REA loan rate. Any increase in interest rates would of necessity result in a drastic increase in electricity rates. Many of the public systems, it is said, could not survive and would be absorbed by private power interests.

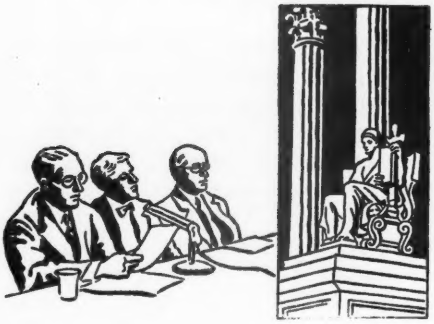
West Virginia

Examiner Rules Refund

A FEDERAL POWER COMMISSION examiner has ruled that United Fuel Gas Company should not be handed "windfalls" on its natural gas rates and that it should cut its rates and pay back customers for extra charges made over the past three years.

Examiner Kelly's decision held that United Fuel, a Charleston, West Virginia, subsidiary of the Columbia Gas System, should reduce its wholesale natural gas rates by $2,818,000 a year, retroactive to January 1, 1956, and make appropriate refunds to its utility customers. The company serves 10 wholesale customers in Kentucky, West Virginia, and Ohio. Kelly ruled against the company's planned treatment of the statutory oil and gas percentage depletion allowance and intangible costs on productive well drilling in figuring the income taxes to be made a part of its cost of service for rate-making purposes. But he upheld the company's position on the effect of rapid depreciation for tax purposes.

The reduction of the wholesale rate order by Examiner Kelly was in an amount to cover the tax savings resulting from the company's use of the percentage depletion allowance and the inclusion of intangible drilling costs. He pointed out that the FPC generally has held that the allowance paid for taxes should not exceed the taxes paid. The decision of the examiner is subject to FPC review.



Progress of Regulation

Trends and Topics

Requirements for Changes in Contract Rates

THE Supreme Court decision in the Memphis case (reviewed in the FORTNIGHTLY, January 1, 1959, at page 59) clarifies the rules relating to rate changes, pursuant to the Natural Gas Act, when service is rendered under a contract.

A rate increase may be filed under § 4 if service is supplied under an agreement providing for payment under the seller's rate schedule or any effective superseding schedules on file with the Federal Power Commission. Rates cannot be raised by filing under § 4 when a specific rate is established for the term of the contract, in view of the decision in the Mobile case (12 PUR3d 112).

The filing of tariffs to change contract rates is discussed in PUBLIC UTILITIES FORTNIGHTLY, March 29, 1956, at page 489, but a more recent court decision and a commissioner's views are worth noting.

Opinion of Kansas Court

The Kansas law recognizes that rates to individual customers may be set by private contracts. It also recognizes the power of the state commission to change such rates.

But where a contract is filed with the commission and the rates are sought to be unilaterally changed by the public utility by filing a schedule of new rates, according to the state supreme court, a duty is imposed on the commission to investigate the existing contract rates, and they may be abrogated only upon an express finding that they are unreasonable and that they affect adversely the welfare of the public. In the absence of such a finding, commission approval of a proposed schedule of new rates cannot and does not abrogate existing contract rates (21 PUR3d 157).

Views Expressed at NARUC Convention

L. W. Leibrand, chairman of the New Mexico Public Service Commission, in a discussion of the Memphis case before the National Association of Rail-

road and Utilities Commissioners, prior to the Supreme Court decision, not only commented on questions arising under the Natural Gas Act, but said that the New Mexico commission was formulating some new thinking on the subject. That commission has always considered the rate sheet to be the primary document in its files, and it has encountered no difficulty with the courts with respect to its rate-filing procedure; but if a contract does specify a rate, the commission now finds that the utility is in trouble if it needs a rate changed, even though the contract provides that it shall at all times be subject to such changes or modifications as the commission may from time to time direct in the exercise of its jurisdiction. He said that if that wording does not mean what the commission has interpreted it to mean for the last seventeen years, the commission should do something about it.

The commission proposed to suggest to the utilities (electric, gas, and water) that consideration be given to a new type of contract or service agreement which will not spell out the price of the service or even a specific rate schedule number. Most utilities were filing rate schedules that would service most all types of business and industry, and only in rare instances would a contract be necessary to provide for unusual conditions of service, such as point of delivery, quality, quantity, contributions, or advances.

It was suggested that there be a contract provision that the utility should have the right at any time to make changes in rate schedules in the manner prescribed by the New Mexico Public Utility Act. This, however, would not be construed as preventing the customer from filing protests or intervening petitions in proceedings before the commission when the lawfulness or reasonableness of rates is in issue, or prevent the customer from initiating proceedings.

Commissioner Leibrand said that the customers were not going to like such a document, at least at the start, but he pointed out that the customer found it almost impossible to secure long-term contracts with a stated firm price for most other items necessary for business operations. The commission believed such a plan would afford to all customers better protection ratewise than was required by the Mobile or Memphis cases.

Review of Current Cases

Authorization of Pipeline Projects Denied Because of Inadequate Showings

After lengthy hearings in consolidated proceedings, the Federal Power Commission with "profound regret," denied authorization of competitive projects proposed under § 7 (c) of the Natural Gas Act by four principal applicants, Northern Natural Gas Company, Michigan Wisconsin Pipe Line Company, Midwestern Gas Transmission Company, and Tennessee Gas Transmission Company. In each instance there was a failure to prove some basic particulars essential to

authorization, either respecting adequacy of gas supply, markets, or physical or economic feasibility. Other applications dependent upon these were also denied. The applications related to service in the north-central and midwestern areas of the United States.

The commission observed that the problem which it had to resolve was how best to meet the immediate and long-term natural gas requirements of these areas. The only authorizations granted were noncompetitive proposals—Northern's proposals pertaining to an exchange transaction with El Paso Natural Gas Company and additional service to existing customers. The commission indicated that the parties may file new applications and pointed out, in the course of its opinion, various factors to be considered in making a case for certification of such projects.

Canadian Gas Supply Inadequate

Midwestern proposed an 1,100-mile pipeline project extending from Tennessee, where it would receive 204,000 Mcf of gas per day, to Canada, where it would receive another 204,000 Mcf near Emerson, Manitoba.

Most of the natural gas would be sold to resale customers, with 115,000 Mcf per day going to two steel companies in the Chicago-Gary area. It was not shown, however, that the Canadian supplier, Trans-Canada, had sufficient gas reserves above those needed for service in Canada to supply Midwestern. Nor had Trans-Canada obtained Canadian authorization of the contemplated sales, though this would not be prerequisite to the issuance of a certificate by the Federal Power Commission. Moreover, the commission thought the sales to the steel companies as proposed in this case would be detrimental to consumers in the Chicago-Gary area and against the public interest.

Midwestern had presented its case as an entity so as to preclude a separation of the northern part of its system, which would use Canadian gas, from the southern part, which would use American gas. With the failure of the Canadian supply, the whole project had to fail since the commission had no means of appraising separately the feasibility of the southern portion of the project and the proposed service to the Chicago-Gary area.

The commission expressed the belief that Canadian gas should and inevitably would be made available to areas of this country, to the mutual benefit of United States purchasers and Canadian sellers. It indicated that importation authorization would be granted when more satisfactory commitments are made and more adequate supplies are shown.

Since the Midwestern project would not be authorized, the commission did not grant Tennessee's application for authority to sell gas to Midwestern. A noncompetitive proposal by Tennessee relating to the construction of facilities to serve customers in the company's present market area in the central Atlantic and New England states was deferred for later decision.

Northern's Storage Field Problem

Northern proposed to extend its existing facilities northward from a terminus near St. Paul to Duluth, Minnesota, and Superior, Wisconsin, to serve these cities, together with laterals to serve communities en route. An extension was also proposed to serve the Mesabi Iron Ranges area in northern Minnesota. This project would depend in part on the withdrawal of 50,000 Mcf of gas per day from the company's Redfield storage field. But the

physical and economic feasibility of this storage field was not established.

Permanent authorization was granted to Northern as to certain facilities previously authorized on a temporary basis for service to existing customers. The remaining service proposed by Northern would require 96,500 Mcf per day, to be supplied in substantial measure from the unproven Redfield storage. An added complication was provided by interveners seeking gas from Northern for 41 communities which the company had not proposed to serve.

The commission decided to deny authority to Northern to provide any of the new noncompetitive service, as well as the 41 communities. Since the company had attempted to support its proposed expansion as a whole, the commission could not give preference to one market category over another. Furthermore, it was noted, certification of the new noncompetitive markets could well be held to preclude the comparative consideration required by law of Northern's proposal with a competitive proposal of Midwestern in the event new competitive applications should be filed.

Economic Feasibility Not Shown

Michigan Wisconsin proposed to construct facilities and sell gas to ten distribution companies for new gas service to communities in Wisconsin and Michigan. In seeking to show the economic feasibility of the project, however, the company calculated its rate of return on a system-wide basis rather than on the basis of the additional facilities it proposed to construct, as required by commission regulations. This system-wide return, moreover, was dependent on a proposed general increase in rates. A later study offered by the company relating to the new facilities failed to give proper consideration to interruptible service. The commission thought the proposed service would entail an exceptionally high cost, resulting in a lack of the necessary economic feasibility. *Re American Louisiana Pipe Line Co. et al. Opinion No. 316, Docket Nos. G-2306 et al. October 31, 1958.*

Tuscaroras Win Temporary Stay against Power Project

PENDING determination of a petition for a writ of certiorari, Supreme Court Justice Harlan granted the Tuscarora Indian Nation a stay of the mandate of a federal court of appeals which had held that the New York Power Authority could condemn lands of the Tuscaroras needed for the Niagara power project. The project had been licensed by the Federal Power Commission. The Tuscaroras have vigorously opposed the proposed taking of a portion of their lands at Niagara Falls. This litigation began in an action by the Indians attacking the power of the state authority to take their lands.

Another branch of the same general controversy relates particularly to the issuance of a license for the power project and involves a review of the validity of the license by another court of appeals. (The latter proceeding is reviewed below.)

Although Mr. Justice Harlan had some doubts about the full court's granting of certiorari, he nevertheless thought the Tuscarora lands should be protected for the moment. The authority had indicated that it would proceed to erect power lines on a portion of the Indian lands if it could obtain a decree of condemnation putting it into possession of the lands. However, the petition for a writ of certiorari was subsequently denied, whereupon the stay

would expire by the terms under which it was granted. *Tuscarora Nation of Indians v. Power Authority of State of New York, 79 S Ct 4.*

Tuscaroras Win Round in Fight to Save Tribal Lands From Niagara Power Project

On appeal from a Federal Power Commission order authorizing the New York Power Authority to construct a Niagara power project that will flood certain lands of the Tuscarora Indians, the court of appeals for the District of Columbia circuit remanded the order for further findings as to the effect the taking of the Indian lands will have on the purpose for which the Indian reservation was established.

Under § 3(2) of the Federal Power Act the word "reservations" includes "tribal lands embraced within Indian reservations." A proviso in § 4(e) requires that "licenses shall be issued within any reservation only after a finding that the license will not interfere or be inconsistent with the purpose for which such reservation was created or acquired." A long-existing statute provides that no conveyance of Indian lands shall be valid unless made by treaty or convention entered into pursuant to the Constitution.

A special statute enacted in 1957 directed the commission to issue a license to the Power Authority for a Niagara power project. It did not specify the works of which the project should consist, nor did it prescribe the location. Besides naming particular conditions, it contemplated compliance with the Federal Power Act and application of the commission's procedural rules.

United States Interest in Lands

The lands involved in this appeal adjoin the Tuscarora reservation and were purchased by the Indians with the proceeds from a sale of lands in North Carolina. The money and the acquisition were handled by the United States on behalf of the Indians. It was contended by the commission and the Power Authority that the United States has no interest in the acquired property. They pointed out that the lands are held by the Tuscaroras in fee simple.

The court disagreed with this contention, indicating that the guardianship of the United States over the Indians, which includes protection of their lands from improper alienation, constitutes sufficient interest in their lands to require congressional consent to any alienation of them. Dealings with the Indians, it was pointed out, are within a special clause of the Constitution conferring power on Congress to regulate commerce with the Indian tribes. The 1957 special statute did not contain the necessary congressional consent to the proposed taking. Apparently Congress had not been advised that the project would involve the taking of Indian lands.

In allowing the commission under § 4(e) of the Federal Power Act to deal with reservations, as defined in § 3(2), Congress exercised not only its power under the property clause of the Constitution but also its power to regulate commerce with the Indian tribes and, therefore, to allow alienation of the land here in question, said the court.

The taking of the Tuscarora lands did not appear to be vital to the construction of the Niagara project but was merely desirable from a standpoint of economy. In these circumstances the court ruled that the commission could not issue a license for the construction of a reservoir on the

Tuscarora lands without first making the finding required by the proviso in § 4(e). No such finding having been made, remand was necessary. *Tuscarora Indian Nation v. Federal Power Commission et al. No. 14475, November 14, 1958.*

Extracurricular Expense Disallowed

THE Wisconsin commission excluded expenses incurred by a municipal water plant in supplying police and fire call service, when it determined the revenue requirements. It had been shown that the company was still operating its pumps manually because police call and fire department call service was being supplied by pumping station personnel on a 24-hour basis. If such personnel were not required to operate the calls, automatic pumping controls could be installed.

Therefore, the minimum theoretical cost to the utility of rendering the extra service was established as the difference in operating costs between manually controlled pumping equipment and automatically controlled operation.

Manager's Salary

Another downward adjustment was made in connection with the city manager's salary allocated to the water plant. The city had allocated one-half, but the manager was unable to furnish any information to substantiate the apportionment.

It was indicated that his duties were for the most part administrative, as executing policies determined by the city council; technical operation of the utility was carried out by other personnel under a superintendent.

In the absence of definite information and based on consideration of comparable utilities, the commission believed that 10 per cent would be the maximum allowable allocation for the manager's salary in this instance.

Increased rates were authorized which would produce a return of 5.5 per cent on the net book value rate base. *Re City of Lake Geneva, 2-U-5064, November 13, 1958.*

Working Capital Allowance Excluded from Rate Base

THE California commission granted a $3,746,000 rate increase to the Pacific Lighting Gas Supply Company, a company engaged in selling gas for resale to two affiliated distributing companies. The new rates were calculated to yield a return of 6.5 per cent.

The company unsuccessfully sought an added allowance of 0.5 per cent in its rate of return to offset the alleged effect of regulatory lag, and other factors which it claimed precluded it from earning the return found to be reasonable. The commission said that by allowing for the latest known ad valorem tax rate and by ruling on the company's price for the small amount of its gas purchases, not covered by firm contracts, it had substantially removed the major valid reasons for the company's request for the additional allowance. It also pointed out that the authorized rates would be granted at the start of the company's test year 1959 to provide it the opportunity to earn a full return for all of the year.

Working Capital

The main difference between the commission's estimate of rate base and the company's estimate was in the item of

working capital allowance. The commission's staff pointed out that working cash is included in a rate base so that the investors may be compensated for money which they have supplied over and above the investment in tangible and intangible property in order to enable the company to operate economically and efficiently.

The staff argued successfully that the short collection time for revenues from the company's customers and the accrual of money for income taxes were sufficient so that the investors would not need to supply any additional money for working cash.

The commission said that it was fully cognizant of the fact that no business enterprise can operate successfully without an adequate supply of working cash. In the case of a utility, when such cash is provided by the investors, it should be included in the rate base. The applicant, however, serves only two affiliated customers; allowances for working cash have been provided in the rate bases for these two customers, and they are prompt in their payments to the applicant. For these reasons the commission made no allowance for working cash. *Re Pacific Lighting Gas Supply Co. Decision No. 57598, Application No. 40079, November 10, 1958.*

Economies, As Well As Rate Increases, Can Improve Earnings

THE Florida commission denied the application of a truckers' association for authority to increase minimum and less than truck load intrastate freight rates of members. The composite operating ratio of the participating carriers, 96.5 per cent, hardly justified a general increase, said the commission.

Earnings can be improved through economies as well as rate increases, continued the commission. This is particularly true where rate increases have pyramided one on another until shipper resistance approaches the point where further increases may actually result in an overall loss of revenue because of reduced tonnage.

The commission said that one of the inherent weaknesses in regulation is the fact that the regulatory agency cannot invade the field of management and, therefore, has a very restricted jurisdiction over operating economies, whereas the revenues of regulated industries are wholly dependent upon the rates fixed by the regulatory authority. As a result, regulated industries all too frequently make rate increases the first rather than the last resort and defer, or altogether ignore, operating economies that conceivably could bring about the desired improvement in earnings. *Re Florida Intrastate Rate Bureau, Docket No. 5420-CCT, Order No. 4417, October 29, 1958.*

Appeal to Supreme Court Dismissed As Premature

THE U. S. Supreme Court dismissed as premature an appeal by short-haul terminal railroads from a judgment of the district court setting aside an ICC order sustaining as reasonable the per diem rates charged by long-haul trunk-line railroads for the hiring of cars.

The terminal roads had contended that determination of a uniform rate to be applied throughout the industry was beyond

the commission's adjudicatory jurisdiction and lay exclusively within its rule-making power. Although the lower court had rejected this contention, the order had been set aside and the cause remanded to the commission with directions to consider an alternative method of compensation which would introduce a mileage factor into the per diem.

In a memorandum before the Supreme Court, the commission had expressed its readiness to proceed in accordance with the remand. As a result, the court found the question raised prematurely presented. This was whether the commission has adjudicatory jurisdiction to determine a rate of uniform application throughout the industry or must engage in what the district court had characterized as the "full-scale investigation" accompanying promulgation of a rule.

The court pointed out that the commission had recognized that further investigation and more detailed findings would be requisite to compliance with the remand. Should such proceedings lead the commission to reconsider its estimate of the desirability of a per diem embracing a mileage factor, the court pointed out, the result might well be not a declaration that the present per diem is just and reasonable, but the establishment of a new rate. If, conversely, the commission should adhere to its original view, it would be in the light of new findings derived from its further investigation.

In either event, the proceedings on remand might lose the characteristics of an adjudicatory nature and take on those of a rule-making procedure. This would cause the question sought to be reviewed to disappear. As the commission had observed, the record presented what was essentially only an interim ruling. *Boston & Maine R. Co. et al. v. United States et al. 3 L ed 2d 34.*

Lower-than-system-wide Return on Service Extension Discounted

THE New Jersey commission ordered a water company to extend service to a group of applicants and to refund deposits which had been made under protest.

The commission found that public convenience and necessity required the extension, which would furnish sufficient business to justify construction and maintenance.

"Sufficient business" had been determined by the courts to mean a reasonable number of prospective users in a reasonably integrated or localized group within the franchise area and within a reasonable distance of existing facilities desirous of service.

Amount of return, pointed out the commission, may enter into the exercise of the commission's discretion as to whether the group constitutes "sufficient business," but lack of profit or inadequacy of profit is important only as it affects the overall return to the utility.

It had been shown that the return on this particular extension would be less than the return on the present total plant, but the commission held that this was not dispositive of the matter, that the evidence supported the conclusion that the extension would affect the company's present overall return negligibly. The financial condition of the utility reasonably warranted the original expenditure for the extension. *Re Washington Water Co. Docket No. 10872, November 10, 1958.*

Schedule Changes Held Managerial Function

THE Pennsylvania superior court reversed a commission rule requiring railroads to obtain approval before changing passenger train schedules. Railroads were held to have the initial right to adjust train operations and time schedules as a matter of managerial discretion, subject to corrective action by the commission after investigation and hearing. The court was convinced that the unprecedented requirement of prior approval of such scheduled changes was an extension of the commission's power, unwarranted by existing statutes, and that the new regulation was legislation rather than rule making.

The crux of the controversy was a question merely of timing. The railroads did not seek to impose any restraint upon the regulatory powers of the commission and did not raise any question as to the right of the commission to regulate passenger train service or to require adequate service, even to the extent of the restoration of trains eliminated or the operation of new trains if evidence developed in a proper hearing established justification therefor.

The railroads contended, though, that in the absence of express authority to that effect from the legislature, the commission could not interfere with the discretion of management in making proposed schedule changes, in advance of hearing. The court agreed.

Statutory Power

The area of administrative activity is not boundless, said the court. The commission's power is statutory, and the legislative grant of power to act in any particular case must be clear. The requirement of due process applies to proceedings before administrative tribunals as well as before judicial bodies. Among the restraints affecting the performance of administrative functions are requirements that interested parties be afforded a fair and open hearing, that findings of fact be made so that the action may be reviewed by the courts, and that a reason for action be assigned.

Managerial Discretion

A public utility has the right to manage its own affairs to the fullest extent consistent with the public interest. It is not within the province of the commission to interfere with the management of a utility unless an abuse of discretion or arbitrary action is established.

The commission may not, by promulgating a general order or general regulation, avoid the necessity of requiring substantial evidence to support its action in a particular case. It may not, by a general order, adopt a policy which may be used as a substitute for evidence in a proceeding before it. And it may not avoid the constitutional requirement of due process in a particular proceeding by reference to a general rule setting forth some policy.

Advisory Opinion

The court noted that it was being called upon to render an advisory opinion in advance of an actual application of the regulation. However, it believed it would be unwise to delay or postpone decision on such technical ground, particularly in view of the fact that no question regarding the propriety of the appeal had been raised or argued by any of the parties.

Dissenting Opinion

Judge Rhodes, in a dissenting opinion, argued that the majority's opinion was advisory in advance of the application of a regulation promulgated by the commis-

sion, and that it constituted an erroneous interpretation of statutes relating to the commission's power to make regulations in furtherance of the provisions of law.

The function of rule making is to be distinguished from action of a quasi-judicial nature taken by the commission, said the judge. Rule making is essentially legislative; the promulgation of a general rule applicable to all or a particular segment of the utilities is not in itself a function from which a direct appeal may be taken. Rules and regulations are subject to judical review only when they become involved in a justiciable proceeding.

Limited Rule

Furthermore, the dissenting judge felt that the commission's rule was a limited one. It did not require prior application or approval for every change in the schedule such as those normally made in the institution of daylight-saving time or the reversion to standard time. The rule applied only to the "removal, elimination, or substantial change" in service; that is, a reduction in the level of service provided to the public. Presumptively, existing service is necessary to the public interest.

The dissenting judge pointed to a statute relating to the necessity of a railroad obtaining commission approval to abandon service. It seemed obvious to him that substantial changes in the schedule of a train constitute partial abandonment, thus vesting the commission statutorily with the power to promulgate the controversial rule. *Pennsylvania R. Co. v. Pennsylvania Pub. Utility Commission, No. 58½, November 14, 1958.*

Direct Service to Adjacent Telephone Exchange Held Essential to Adequate Service

THE Wisconsin commission ruled that residents of the territory of Baileys Harbor exchange of the Door County Telephone Company were not afforded adequate service. They sought direct service with the adjacent service area of the Sturgeon Bay exchange of Wisconsin Telephone Company. Both companies objected to the requested direct service but offered to provide service on a foreign exchange basis. The petitioning residents pointed out that most of their business and social relationships were with people in the Sturgeon Bay area.

Only three telephones were in service in 70 residential and business premises in the petitioners' area. This situation apparently resulted from the community of interest in Sturgeon Bay and from a low grade of service rendered through the Baileys Harbor exchange. Although Baileys Harbor did not yet have dial equipment, some construction had been commenced in anticipation of the conversion.

The commission indicated that it was reluctant to deprive a utility of potential operating territory if it could render adequate service. In this case, however, toll-free service to Sturgeon Bay was considered essential to adequate service. It could be furnished either on a direct basis from the Sturgeon Bay exchange or by means of extended-area service through the Baileys Harbor exchange. In view of the pending dial conversion program at Baileys Harbor exchange, the commission thought the Door County Telephone Company should have the opportunity of determining whether a sufficient community of interest exists between Baileys Harbor and Sturgeon Bay to warrant the establishment of extended-area service.

The commission ruled that unless a sat-

isfactory plan to provide extended-area service between Baileys Harbor exchange and the Sturgeon Bay exchange were submitted by March 1, 1959, the Wisconsin Company would be required to extend direct service to the petitioners. *Tiedke et al. v. Wisconsin Teleph. Co. 2-U-4994, November 7, 1958.*

Telephone Service Restored to Delinquent Subscriber Without Deposit Guaranty

THE Wisconsin commission ordered a telephone company to restore service to a repeatedly delinquent subscriber and refused to permit the company to impose a $20 deposit requirement to insure future payment of bills. The subscriber had in fact paid all bills (having tendered payment for the last bill) but not until after many written demands had been made upon him, as well as reminders and innumerable telephone calls requesting payment of bills.

Under its filed rules, the company may require customers to deposit a suitable amount as a guaranty of payment of charges. The deposit rule could be enforced in this case, said the commission, but it found "an area of probable misunderstanding on the part of the subscriber which merits a more lenient action." The commission referred to his apparent failure to understand that delinquent payment of bills results in extra expense to the company. The subscriber testified that he would pay bills promptly in the future. Enforcement of the deposit rule in this instance was therefore considered unnecessary for the time being at least. *McCormick v. Wisconsin Teleph. Co. 2-U-5021, November 13, 1958.*

Fluoridation Surcharge Denied

THE California commission, in granting a water company's application for increased rates, denied authority to impose a surcharge, on a per customer basis, amounting to 20 cents per month, to cover the special costs of fluoridation. It was the commission's opinion that surcharges are undesirable and generally should be reserved to meet conditions of an emergency nature.

The evidence was clear that the total costs of water treatment in the district very closely approximated 49.9 cents per customer per month. Of this total, fluoridation accounted for 18.8 cents. The commission did not think that the latter portion should be separately stated any more than should the cost of chlorination or flocculation or any other element of water treatment.

In any event, pointed out the commission, fluoridation has now become a regular part of the water treatment ordinarily provided in the district and the costs thereof are in no sense of an emergency nature. The commission specified rates which would not separately state such costs.

The increase granted would produce a return of 6.49 per cent on the company's depreciated rate base, which the commission found to be within a zone of reasonableness. *Re California Water Service Co. Decision No. 57643, Application No. 40042, November 25, 1958.*

Commission Investigation of New Jersey Train Disaster

THE New Jersey commission recently concluded an investigation of the circumstances attending the disaster of September 15th at the Newark bay drawbridge. It will be recalled that two diesel locomotives and three passenger coaches rode over the end of the southwest approach span and into the bay beneath the raised southwest lift span. The engineer, fireman, conductor, and forty-five passengers were killed.

The commission found that the train had passed an automatic signal at an excessive rate of speed and in violation of the operating rules and signal indications. The engineer had failed to stop his train at a home signal in accordance with the stop indication displayed by that signal.

The mechanical and braking equipment of the train was functioning properly during the run and the signal equipment and signals were functioning properly prior to and at the time of the accident. The automatic derail at a certain home signal was not effective in reducing speed or stopping the train.

The evidence indicated that automatic tripper devices presently in use on certain railroads would be effective in stopping a train and preventing an accident such as this. Certain home signals were found not to afford sufficient stopping distance.

There had been no evidence to indicate that the engineer or the fireman suffered a physical disability prior to or at the time of the accident. However, the commission held that failure of an employee to qualify as a locomotive engineer for medical reasons should preclude him from service as a fireman in road passenger service. The commission also said that all power units and locomotives operated in passenger road service in New Jersey should be equipped with "dead-man control."

The railroad was ordered to take specific measures with regard to certain visual, home, and automatic approach signals, tripping devices on bridge approaches, automatic and speed-control equipment, and automatic locking devices in controller hands. *Re Central R. Co. of New Jersey, Docket No. 10920, November 7, 1958.*

Mandatory Injunction against Commission Service Discontinuance Order Denied

AN interesting question was put before the Illinois appellate court when a lower court dismissed an action for a mandatory injunction to compel a railroad to restore passenger service between certain cities and villages. The discontinuance had been authorized by the commission.

The contention was advanced that the public interest requires equity to supervise the operation of a public utility in order to alleviate any distress the public may have suffered as the result of a proceeding before an administrative agency established to regulate utilities.

The court held that it did not have jurisdiction to compel restoration of service, that the circuit court was the proper court for review of a commission order alleged to inconvenience the public. The appealing party could not circumvent the jurisdiction and authority of the commission on the basis of public need.

A mandatory injunction, pointed out the court, is an extraordinary remedial process which is not a matter of right, but may be granted only upon the exercise of sound judicial discretion in cases of great necessity.

The claim for such relief, in the

instant case, had been predicated on the commission's want of jurisdiction over the Chicago Transit Authority (the owner of a segment of the right of way formerly used by the railroad), on the power of equity to review the confiscatory effect of commission orders pertaining to rate making, and on alleged fraud and a threatened multiplicity of suits.

The court refused to assume jurisdiction to grant the extraordinary remedy requested solely because the commission had no authority over the owner of a mere segment of the right of way formerly used. No property right violations had been alleged, and an allegation of fraud on the part of a member of the commission was held insufficient on its face to warrant jurisdiction. *Egan et al. v. Chicago, A. & E. R. Co. et al. 153 NE2d 286.*

Telephone Company Gets First Rate Increase Since 1927

THE Nebraska commission authorized United Telephone Company of the West to increase rates by about one-half the amount requested. The company, which has had no general rate increase in Nebraska since 1927, pointed to a substantial construction program now in progress which will require large amounts of new capital from outside sources. It alleged that the increase was needed in order to maintain a financial status sufficient for the company to discharge its public duties, maintain its credit, and provide a reasonable return sufficient to attract capital. The commission said the revenue increase which was allowed will afford a rate of return of 6.75 per cent on a cost rate base, 6.11 per cent on a fair value rate base, and 6.55 per cent on a net book value rate base. *Re United Teleph. Co. of the West, Application No. 21298, August 6, 1958.*

Television Permit Cases Remanded

THE U. S. court of appeals remanded to the Federal Communications Commission cases involving an award of a television construction permit. The commission itself had made the motion for remand and had alleged that public charges had been made in the course of a congressional investigation that one of the commissioners should have disqualified himself. The court instructed the commission to proceed to hold evidentiary hearings concerning the possibility that the award might be void ab initio or voidable, and that a party, or various parties, might be disqualified by reason of misconduct to receive an award. *WKAT, Inc. et al. v. Federal Communications Commission, 258 F2d 418.*

Gas-peaking Service Ruling Reversed

THE Federal Power Commission has reversed an initial decision by one of its presiding examiners authorizing Transcontinental Gas Pipe Line Corporation to provide a transportation service of 25,553,000 cubic feet of gas per day for Virginia Electric & Power Company for use at its Possum Point power plant.

The decision was issued by FPC Presiding Examiner Woodall on May 29th. The commission order also reversed the presiding examiner's direction to Tranco to provide a complementary winter-peaking service to Washington Gas Light Company of Washington, D. C., and Commonwealth Natural Gas Corporation of Richmond, Virginia. Transco originally proposed to provide the peaking service to Atlantic Seaboard Corporation, but this was denied by the examiner. The FPC ruling eliminates peaking service for any of the companies.

The commission concluded that Transco's proposals "should be denied since Transco has not shown that its proposed rate for the complementary transportation service and peaking service are proper and reasonable." The FPC said that "Since the company has not sustained the rates for these services, we must deny the facilities for rendering them, as well as all requests for gas to have been delivered thereby."

The commission staff had contended that Transco's cost allocation was improper since the company did not start with a cost of service to determine rates but assumed a certain rate level before apportioning costs, so that in effect the company started with the desired result. The rate level, the staff maintained, was assumed for the purpose of providing a transportation rate sufficiently low to make the service to Vepco feasible in competition with coal.

The commission said that the staff's objections to Transco's proposed rates were well founded. The record shows, the FPC said, that Transco did not design its proposed rates in accordance with commission-established precepts or with any reasonable or proper method of cost allocation, nor justify its failure to do so. "We conclude that Transco has not sustained the burden of supporting the project it proposes in this case," the FPC stated.

Although the FPC last September granted Transco temporary authorization to construct and operate the proposed facilities, estimated to cost $2.7 million, it restricted their use to previously authorized service. Also the commission required in its temporary authorization that in the event the FPC ultimately denied a certificate for the proposed lines, the installation cost of the facilities would be removed from Transco's rate base and the cost charged to its stockholders. *Re Transcontinental Gas Pipe Line Corp. Docket Nos. G-12059 et al. December 17, 1958.*

Other Recent Rulings

Water Rate Increase. The Pennsylvania commission approved a water company's proposed rate increase after finding that it would provide a return of 5.76 per cent on a fair value rate base, such return being considered reasonable. *Pennsylvania Pub. Utility Commission et al. v. White Deer Mountain Water Co. C. 16908 et al. November 13, 1958.*

Rival Application Granted. An application for an extension of territorial authority as a common motor carrier of household goods was granted by the Florida commission despite two rival applications for identical authority, where the public convenience required expanded service of all three applicants. *Re Griffin (C. E. Griffin & Sons, Transfer), Docket No. 5421-CCT, Order No. 4410, October 13, 1958.*

Lease Ineffective. The U. S. court of appeals affirmed an injunction issued

against a trucking company which, under the guise of a lease, performed all the operating functions of a common carrier for a wholesale grocery company, where the lease attempted to set up a five-year period but allowed contractual escape without cause. *Lamb (Poynor & Lamb Trucking) v. Interstate Commerce Commission, 259 F2d 358.*

Picketing Does Not Excuse Liability. The U. S. district court held that a common carrier operating as a freight forwarder and motor common carrier was not relieved from liability to public warehouses for failure to make deliveries because of the custom of union members to refuse to cross picket lines. *Merchandise Warehouse Co., Inc. v. A. B. C. Freight Forwarding Corp. et al. 165 F Supp 67.*

Not Subject to Review. The U. S. district court held that an Interstate Commerce Commission order denying an application for temporary authority to take over managerial control of a motor carrier was not subject to review by the court pending hearing and determination of an action before the commission for approval of a consolidation or merger of properties of two or more motor carriers, or a purchase, lease, or contract to operate the property. *M. P. & St. L. Express, Inc. et al. v. United States et al. 165 F Supp 677.*

Rule of Thumb Unauthorized. The Missouri supreme court held that the commission was not authorized to institute a rule of thumb that transportation of dairy products by a co-operative to market requires a certificate of convenience and necessity where a statute specifically exempted from regulation the transportation of farm products by a co-operative. *Missouri ex rel. Smithco Transport Co. v. Missouri Pub. Service Commission et al. 316 SW2d 6.*

Note Issue. Pending permanent financing, the Federal Power Commission authorized California Electric Power Company to issue promissory notes to meet construction costs under an agreement providing for a revolving line of bank credit in the amount of $15 million at the bank's prime rate and with right of prepayment without penalty. *Re California Electric Power Co. Docket No. E-6845, October 29, 1958.*

Bid for Debentures. The Federal Power Commission approved as reasonable a competitive bid for $15 million of debentures of an electric company at a price of 100.03 per cent of principal amount, with an interest rate of 5¼ per cent. *Re Puget Sound Power & Light Co. Docket No. E-6842, October 30, 1958.*

Private and REA Electric Extensions. The Colorado commission granted separate applications of a private electric company and an REA association to serve different districts within a nonexclusive area in order to accord each a certain amount of normal orderly growth and in order to effect the stability of each utility. *Re Public Service Co. of Colorado, Application Nos. 16564 et al. Decision No. 51203, November 3, 1958.*

Passenger Trains Discontinued. Wisconsin Central Railroad Company obtained permission from the Wisconsin commission to discontinue several passenger trains upon a showing that financial losses to the company outweighed the public need for the trains, that the losses could not be continued without impairment of the company's financial condition, and that patronage was continually declining. *Re Wis-*

consin Central R. Co. 2-R-3374, November 4, 1958.

REA Extension Denied. The Colorado commission denied an REA electric association's application for permission to extend service to a certain party where a private electric company, certificated to serve the area, was ready, willing, and able to render the service in accordance with rates, rules, and regulations and extension policy on file and approved by the commission. *Re Union Rural Electric Asso. Application No. 16668, Decision No. 51209, November 5, 1958.*

Substitute Service Permitted. The Connecticut commission granted a railroad's application to discontinue passenger train service between two points on condition that substitute motorbus service be provided in lieu of present rail service, where operational savings from the substitution would assist in fostering a sounder statewide railroad system. *Re New York, N. H. & H. R. Co. Docket No. 9370, November 3, 1958.*

Elimination of Toll Charges. The Illinois commission said that the elimination of toll charges is in the public interest wherever feasible when adjoining exchanges have common interests. *Re Illinois Bell Teleph. Co. No. 45309, November 6, 1958.*

Downward Return Trend Offset. The California commission granted a rate increase to a water company which would produce a return of approximately 6.8 per cent, although a return of 6.5 per cent was found to be reasonable, in order to offset the downward trend over a reasonable future period of time. *Re California Water Service Co. Decision No. 57634, Application No. 39886, November 25, 1958.*

Nonjurisdictional Facilities. The Federal Power Commission declined jurisdiction over a short pipeline proposed to be constructed by an interstate natural gas pipeline company and leased to an independent producer to connect a production field to a gasoline plant of the producer, even though the producer supplied the pipeline company with gas from the gasoline plant, since the pipeline company would not operate the new pipeline. *Re Bel Oil Corp. et al. Docket Nos. G-12421, G-12502, November 10, 1958.*

Return Not Fair Measure. The California commission, in authorizing increased rates for a transit company which would produce an operating ratio of 96 per cent and a return of 22.6 per cent, commented that a return predicated upon the estimated rate base is not a fair measure of the earning position of a transit company, nor of the reasonableness of operating results under various fare structures. *Re San Jose City Lines, Inc. Decision No. 57607, Application No. 40282, November 10, 1958.*

Emergency Gas Sales. Denying an application for rehearing, the Federal Power Commission found ample justification for emergency authorization of sales of gas by Colorado Interstate Gas Company for the account of El Paso Natural Gas Company in the fact that the buyer needed additional gas and the seller needed to dispose of excess supplies. *Re Colorado Interstate Gas Co. Docket No. G-15811, November 12, 1958.*

Industrial Progress

rum Summarizes Progress in Nuclear Field During 1958

E United States during 1958 com-
ed 37 nuclear reactors in this coun-
and abroad, according to a year-
report issued by the Atomic In-
rial Forum, the national associa-
of the U. S. atomic industry.
hlights of the 1958 program fol-

U. S. Power Reactors

ewly completed: During 1958 one er producing reactor came into op-ion in the U. S.—a 200 electrical watt (ekw) boiling water power-space-heat reactor built by Ar-ne National Laboratory for the C near Idaho Falls, Idaho. Com-ion Engineering, Inc. will operate reactor under AEC contract.

egan construction: Construction n during the year on the follow-three power reactors:

A 75,000 ekw sodium graphite tor being built by North American ation, Inc. for the AEC, for op-ion by Consumers Public Power rict of Nebraska, scheduled for pletion in 1960 at Hallam, Nebr.

2. A 22,000 ekw boiling water re-r plant (including conventional erheat) being built by ACF Indus-, Inc. for the AEC, for operation he Rural Cooperative Power Asso-on of Elk River, Minn., scheduled completion in 1960 at Elk River.

A 1,700 ekw pressurized power-space-heat reactor being built by er Kiewit Sons Co., with the nu-r system to be provided by Alco ducts Inc., for the Army Corps Engineers, scheduled for comple-in 1960 at Fort Greely, Alaska.

ontinued operation: The follow-seven U. S. nuclear power plants ch were completed in earlier years inued operation in 1958:

1. A 60,000 electrical kilowatt pres-zed water reactor built by Westinghouse Electric Corp. for the AEC, for operation by Duquesne Light Co., completed in 1957 at Shippingport, Pa.

2. A 6,200 ekw experimental boiling water reactor, completed by Argonne National Laboratory in 1956 at Chicago, Ill.

3. A 6,000 ekw sodium graphite reactor built by North American Aviation, Inc. for the AEC, completed in 1957 at Santa Susana, Cal.

4. A 5,000 ekw boiling water reactor built by General Electric Co. on its behalf, completed in 1957 at Vallecitos, Cal.

5. A 2,000 ekw pressurized water reactor built by Alco Products, Inc. for the Army and the AEC, completed in 1957 at Fairfax, Va.

6. A 300 ekw homogeneous reactor experiment completed by Oak Ridge National Laboratory in 1957 at Oak Ridge, Tenn.

7. A 200 ekw experimental breeder reactor completed by Argonne National Laboratory in 1951 near Idaho Falls, Idaho.

Continued construction: Construction initiated prior to 1958 continued during the year on the following five plants:

1. A 180,000 ekw boiling water reactor being built by General Electric Co. for Commonwealth Edison Co. of Chicago, scheduled for completion in 1959-1960 at Dresden, Ill.

2. A 163,000 ekw pressurized water reactor, with conventional superheat, being built by the Babcock & Wilcox Co. for Consolidated Edison Co. of New York, scheduled for completion in 1960 at Indian Point, N. Y.

3. A 134,000 ekw pressurized water reactor being built by Westinghouse Electric Corp. for Yankee Atomic Electric Co., scheduled for completion in 1960 at Rowe, Mass.

4. A 100,000 ekw fast neutron reactor being built by Power Reactor Development Co. on its own behalf, scheduled for completion in 1960 at Lagoona Beach, Mich.

5. A 20,000 ekw experimental breeder reactor being built by Argonne National Laboratory, scheduled for completion in 1960 near Idaho Falls, Idaho.

Began preconstruction development: Development work expected to lead to construction began during the year on the following two power reactors:

1. A 60,000 ekw boiling water reactor to be built by Bechtel Corp., with General Electric Co. as the nuclear system supplier, for Pacific Gas & Electric Co., scheduled for completion in 1962 at Eureka, Cal.

2. A plutonium production reactor to be capable of later conversion for the production of 300,000 kilowatts of electric power, being designed and developed by General Electric Co. on behalf of the AEC.

Continued preconstruction development: Development work expected to lead to construction continued during the year on the following five reactors:

1. A 66,000 ekw boiling water reactor plant (with conventional or nuclear superheat) to be built by Allis-Chalmers Manufacturing Co. for Northern States Power Co., scheduled for completion in 1962 at Sioux Falls, S. D.

2. A 50,000 ekw heavy water moderated, gas cooled reactor for construction by the East Central Nuclear Group and the Florida West Coast Nuclear Group on their own behalf, scheduled for completion in 1963 in West Florida.

3. A 17,000 ekw pressurized heavy water reactor to be built by Westinghouse Electric Corp. for Carolinas Virginia Nuclear Power Associates, scheduled for completion in 1962 at Parr Shoals, S. C.

4. A 12,500 ekw organic moderated reactor to be built by North American

(*Continued on page 22*)

Aviation, Inc. for the AEC, for operation by the City of Piqua, Ohio, scheduled for operation in 1961 in Piqua.

5. A 10,000 ekw sodium-heavy water reactor to be built by Nuclear Development Corp. of America for the AEC, for operation by the Chugach Electric Association of Anchorage, Alaska, scheduled for completion by 1962, contingent on the outcome of research and development studies.

Plans announced: AEC announced plans for the following two power reactors which were authorized in 1958 by Congress. At the end of 1958 industrial bids had been sought and received for both projects, but contractors had not yet been selected.

1. A 30,000-60,000 ekw prototype gas cooled, graphite moderated, high temperature reactor on which Congress has set a completion deadline of December 31, 1962. The only proposal came from Philadelphia Electric Co. in association with a group of utilities known as High Temperature Reactor Development Associates, specifying Bechtel Corp. as prime contractor and General Dynamics Corp. as reactor builder. The proposed reactor location is Peach Bottom, Pa.

2. A pressurized water reactor to produce 1,000 kw of electricity and 2,000 kw of space heat, scheduled for completion in 1961 at the Sundance Air Force Station in Sundance, Wyo.

Plans canceled: Pennsylvania Power & Light Co. and Westinghouse Electric Corp. announced the cancellation of plans to build a 70,000-150,000 ekw aqueous homogeneous reactor.

Began new power reactor studies: During the year the following U. S. companies received new contracts for the study of power reactor concepts:

1. American Radiator & Standard Sanitary Corp. for a study of a mercury cooled fast reactor on behalf of the AEC.

2. Babcock & Wilcox Co. for a study of a gas suspension reactor on behalf of the AEC.

3. Bechtel Corp., with North American Aviation, Inc. as nuclear subcontractor, for a study of an organic cooled reactor on behalf of the AEC.

4. Curtiss-Wright Corp. for a study of compact, mobile nuclear power plants of up to 2,000 ekw for military use.

5. Ebasco Services, Inc. with General Electric Co. as nuclear subcontractor, for a study of a boiling water reactor on behalf of the AEC.

6. General Dynamics Corp. for a study of gas cooled reactors on behalf of the Rocky Mountain-Pacific Nuclear Research Group (an association of eight utility companies) and on behalf of San Diego Gas & Electric Company.

7. General Electric Co. for a study of a sodium graphite reactor in which the fuel and coolant would be contained in modules, on behalf of the AEC.

8. General Electric Co. for a study of compact, mobile nuclear power plants of up to 2,000 ekw for military use.

9. General Motors Corp. and Nuclear Development Corp. of America for a study of compact, mobile nuclear power plants of up to 2,000 ekw for military use.

10. General Nuclear Engineering Corp. for a study of a 15,000 ekw boiling water reactor with nuclear superheat on behalf of AEC and the Puerto Rico Water Resources Authority.

11. North American Aviation, Inc. for a study of a sodium cooled thorium breeder reactor on behalf of Southwest Atomic Power Associates (a group of 15 utility companies).

12. Sargent & Lundy, with Nuclear Development Corp. of America as nuclear subcontractor, for a study of a heavy water moderated reactor on behalf of the AEC.

13. Stone & Webster Engineering Corp., with Combustion Engineering, Inc. as nuclear subcontractor, for a study of a pressurized water reactor on behalf of the AEC.

14. Westinghouse Electric Corp. for a study of an organic moderated fluidized bed reactor on behalf of the City of Burlington, Vt.

Continued power reactor studies: The following power reactor studies begun in previous years were continued during 1958:

1. Alco Products, Inc. & Sanderson & Porter who are studying a gas cooled pellet bed reactor concept on their own behalf.

2. American Nuclear Power Associates which is studying a liquid metal fuel reactor concept under development by Raytheon Manufacturing Co.

3. Du Pont Co. which is studying heavy water reactors on behalf of the AEC.

4. General Public Utilities Corp. which is investigating the possible construction of a small water type reactor at Saxton, Pa.

5. New England Electric System which is investigating the possible construction of a 200,000 ekw reactor plant by 1964.

Power Reactor Experiments

Reactors listed in this section designed to lead to power uses but not themselves produce power.

Newly completed: Los Alamos Scientific Laboratory completed a homogeneous reactor experiment for AEC during 1958 at Los Alamos, N. M.

Began construction: Construction began during the year on the following two experimental reactors which designed to lead to power uses but not themselves produce power:

1. A gas cooled package power reactor experiment being built by Aerojet-General Corp. for the AEC, scheduled for completion in 1959 near Idaho Falls, Idaho.

2. A fast molten plutonium reactor being built by Los Alamos Scientific Laboratory for the AEC, scheduled for completion in 1960 at Los Alamos, N. M.

Continued operation: The following two experimental reactors for power uses completed in earlier years continued operation:

1. An organic moderated reactor built by North American Aviation, Inc. for the AEC, completed in [illegible] near Idaho Falls, Idaho.

2. A boiling water reactor experiment known as BORAX-IV, completed in 1956 by Argonne National Laboratory for the AEC near Idaho Falls, Idaho.

Continued preconstruction development: During the year the Babcock & Wilcox Co. continued development of a liquid metal fueled reactor experiment on behalf of the AEC.

U. S. Power Reactors Sold Abroad

New contracts: U. S. industrial concerns received new contracts for the following three boiling water power reactors for installation abroad:

1. A 150,000 ekw plant to be built by General Electric Co. for Società Elettronucleare Nazionale (SENN) scheduled for completion in late [illegible] or early 1963 at Punta Fiume in Italy. The project will be partially financed by the International Bank for Reconstruction and Development, and contractor was selected from among 11 bids from the U. S., Britain and France in a bidding procedure supervised by the World Bank and the Italian government.

2. A 22,000 ekw plant with conventional superheat, to be built by American Machine & Foundry Co. in partnership with Mitchell Engineering [illegible]

(*Continued on page 24*)

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ing Ltd. of Britain, for the Cuban National Bank for Social and Economical Development, scheduled for completion in 1961 at Santa Lucia in Cuba.

3. A 15,000 ekw plant to be built by General Electric Co. for Rheinisch-Westfalisches Elektrizitatswerk (RWE), with Allgemeine Elektrizitats-Gesellschaft as the prime contractor, scheduled for completion in 1960 at Kahl, West Germany.

Continued construction: Westinghouse Electric Corp. continued the manufacture and began the export of components for an 11,500 ekw pressurized water reactor being built for the Centre d'Etudes de l'Energie Nucleaire, scheduled for completion in 1959 at Mol, Belgium.

New plans announced: During the year the following new plans were announced for the purchase of U. S. power reactors by other nations:

1. The Swiss firm of Brown Boveri was reported to have tentative plans for the purchase of a 21,000 ekw pressurized water reactor from Babcock & Wilcox Co. for installation near Lima, Peru.

2. North American Aviation, Inc. received a contract from the Spanish governmental Junta de Energia Nuclear for a feasibility study of a heavy water moderated, organic cooled reactor to produce 20,000 ekw, to produce radioisotopes, and to provide reactor fuel testing facilities.

3. Suisatom, S. A., an association of utilities in Switzerland, announced plans to purchase a 16,000 ekw boiling water reactor with General Electric Co. supplying the design and nuclear components.

4. The Japan Atomic Energy Research Institute announced plans to purchase a 10,000 ekw boiling or pressurized water reactor for installation at Tokai, Japan. During the year the Institute received eight industrial proposals to build the reactor and awarded a contract to Internuclear Co. for consulting services regarding the selection of a reactor builder.

Plans continued: The following plans announced prior to 1958 to purchase U. S. power reactors for installation abroad continued in force during the year:

1. Westinghouse Electric Corp. holds a letter of intent for a 134,000 ekw pressurized water reactor to be built for the Societa Elettronucleare Italiana (SELNI) near Milan, Italy.

2. Vitro Corp. of America holds a contract with AGIP Nucleare of Italy for design and consulting services for a 150,000 ekw plant of unspecified type, to be purchased from a U. S. manufacturer.

Plans suspended: American & Foreign Power Co. announced during the year that it is suspending indefinitely its plans to build small power reactors in Brazil, Cuba and Mexico. Two of the reactors were to be of the boiling water type, manufactured by General Electric Co., and the third was to be of the organic moderated type, manufactured by North American Aviation, Inc.

Electrical Manufacturing Industry Sees 7% Rise in Business Volume During 1959

THE electrical manufacturing industry, looking confidently ahead to future business conditions, expects to produce $21,000,000,000 worth of goods in 1959—a volume almost as high as that reached in the peak years of 1956 and 1957, it is announced by Joseph F. Miller, managing director of the National Electrical Manufacturers Association. This amount also will top the 1958 mark by 7 per cent.

The optimistic prediction for 1959 contrasts sharply with reports of sales in 1958 when the recession brought down the industry's high hopes for a good year to a total of $19.5 billion—a drop of 10 per cent over the $21.6 billion volume recorded in 1957.

Electrical manufacturing groups which fared best in a business way in 1958 were those producing illuminating equipment, signalling and communications equipment and electrical products used in the building equipment and supplies category such as wiring devices, conduit, fuses, molded case breakers and electric house heating equipment. Hardest hit were manufacturers producing industrial apparatus, generating, transmission and distribution equipment and wire and cable.

Sales of major electric appliances and electric housewares also declined in 1958 with business for these items as a whole off by 9 per cent over 1957 levels.

Despite generally disappointing sales in 1958, all segments of the electrical manufacturing industry see better days ahead in 1959. With spending for new construction expected to rise in 1959 by 7 per cent over 1958 levels, manufacturers of illuminating and building equipment see corresponding increases in their business in the offing—a 6 per cent gain for illuminating equipment, and an 8 per cent gain for building equipment. Shipments of [sig]nalling and communication equip[ment] are expected to rise 1 per cent in 1[959] over 1958.

The industrial apparatus group [sees] improved times ahead forecasting [an] increase in volume of 7 per cent [in] 1959. This gain would mean total [business] for this group of $2.9 bill[ion].

Shipments of generation, trans[mis]sion and distribution equipment, [al]ways a bellweather of industrial [con]ditions throughout the nation, are [due] for a slight rise, with manufactur[ers] forecasting a modest 2 per cent [gain] in dollar volume in 1959 over 1[958] when total sales amounted to a[bout] $2,000,000,000.

The wire and cable industry, w[hich] sees an 8 per cent gain in its vol[ume] of business for 1959 over 1958, [re]ported $1.3 billion in sales in 1958.

Electric appliance sales, includ[ing] not only major electric appliances, [but] electric housewares, fans and comm[er]cial electric appliances, will be up 7 [per] cent in 1959 over 1958, according [to] manufacturers' estimates.

Installed Capacitor Kilovar[s] Increased During 1958

THE ratio of installed capacitor k[ilo]vars to peak-load kilowatts in [the] United States increased from .3[8 at] the end of 1957 to .40 at the end [of] 1958, according to W. G. Hart, m[an]ager of power capacitor sales for G[en]eral Electric.

Although installed kilovars did [not] increase at the same high rate a[s in] previous years, Mr. Hart said the [in]crease indicates that more utilities [are] becoming aware of cost reduction [op]portunities afforded by capacitors, [and] that there is a general trend to p[ush] system power factors toward unity.

He pointed out that 1958 saw [ca]pacitor prices reduced to an aver[age] of $4 to $6 per installed kilovar, [and] that now, more than ever, capacit[ors] represent a utility's best buy in el[ec]trical apparatus.

Based on current prices, Mr. H[art] stated, capacitors will yield an inv[est]ment return of approximately 30 [per] cent in terms of loss reduction al[one].

Mr. Hart said 1958 also saw:

1. A continued trend toward the [use] of factory-assembled capacitor equ[ip]ments;

2. Lighter weights and higher r[at]ings—up to 1200 Kvar—for pole[-type] equipments;

3. Increased use of a capacitor a[nd] protective gap in series with a dis[...]

(*Continued on page 26*)

bution transformer to make the transformer self-regulating; and

4. Greater emphasis on corrosion-resistant, maintenance-free materials for capacitor cases and racks.

With the coming of carrier current control, Hart predicted greater use of switched capacitors to meet utility peak load demands. He also predicted that the ratio of kilovars to kilowatts would reach 50 per cent in 1967.

Magnetic Amplifier Systems for Nuclear Reactor Installations

AN eight-page color brochure entitled, "Magnetic Amplifier Systems For Nuclear Reactor Installations," has been issued by Magnetic Amplifiers, Inc., New York 55, N. Y.

Illustrated with photographs and charts, the booklet, designated Bulletin S-963, describes the rod programmer amplifiers designed for the nuclear electric power plant at Shippingport, Pa. A functional diagram outlines an integrated static control system for a nuclear reactor power installation.

Delta-Star Brochure Details Benefits of Transformer Impulse Testing

A NEW brochure of pertinent technical data on the impulse testing of Delta-Star Distribution Transformers has been published by Delta-Star Electric Division, H. K. Porter Company, Inc.

The attractive four-page, two-color publication provides valuable technical information on indications of specific forms of impulse waves, equipment used, and benefits of the test. Other type tests are also listed.

Among illustrations is a set of charts showing typical examples of impulse wave shapes caused by failures, as registered on a memory-type oscilloscope.

This brochure, as well as others covering different features and thoroughly describing Delta-Star's Overall Self Protected Distribution Transformer, can be readily obtained by writing Delta-Star Electric Division, H. K. Porter Company, Inc., 2437 Fulton street, Chicago 12, Illinois.

Largest Turbine-Generator Unit In Northern Wisconsin in Service At Green Bay

A NEW Allis-Chalmers 75,000-kw steam turbine-generator unit (largest in northern Wisconsin) was placed in operation in mid-November by the Wisconsin Public Service Corporation at their Pulliam plant, Green Bay.

Steam conditions for the modern reheat-tandem, 3600-rpm unit are 1450 psig, 1000/1000 F and 1.0 inch Hg absolute. The turbine, No. 7 in the station, is fitted with 23-in. exhaust blades and will be "the most efficient unit in the utility's system" according to a WPSC spokesman. With the new turbine-generator, output of Pulliam Plant will be 267,500 kw.

Some of the advanced design features found on this and other turbines in Allis-Chalmers reheat-tandem line are: side-crossunders, underslung turning gear and ring-type nozzle chest.

The hydrogen-cooled rotor-supercharged generator for the unit is rated 96,000 kva, 0.85 pf, 0.64 scr at 30 psig hydrogen, 13,800 volts.

System capacity for the Wisconsin Public Service Corporation, which has marked its 75th year in the power generating field, will be boosted to 490,500 kw with the addition of another 75,000-kw unit now in production at Allis-Chalmers West Allis (Wis.) Works. It is scheduled for operation in 1960. This unit will be No. 2 in the utility's Weston plant, located near Wausau, Wis.

Southern Counties Gas Sets 1959 Construction Budget At $31,100,000

SOUTHERN Counties Gas Company's 1959 construction budget has been set at $31,100,000—exceeding the previous record outlay in 1957 by $6,700,000 it was reported recently by Guy W. Wadsworth, Jr., president and general manager.

One-third of the 1959 construction budget—or more than $10,600 000—has been allocated for equipment to bring gas service to customers not now connected to the company's lines.

Major single item is more than $9,000,000 to be expended as the company's part of the 1959 costs of building a new 34-inch pipeline from Ivanpah, near the Nevada border, to near Placentia.

This line will eventually bring 550,000,000 cubic feet daily of new supplies of natural gas into Southern California. First deliveries of new gas are expected in January, 1960.

G.E. Dissolves 2 Divisions Reassigns 12 Departments

A REALIGNMENT of 12 General Electric departments in organizational shifts designed to increase corporate efficiency, was announced President Robert Paxton rece No physical relocation of manufacturing facilities is presently con plated, he said.

Mr. Paxton said the moves inc dissolution of two existing pro divisions, and reassignment of departments to other segments of company. The divisions are the M urements and Industrial Products vision with headquarters in Lynn, Mass., and the Construc Materials Division with headquar in Bridgeport, Conn.

Departments of the Construc Materials Division will be reassi as follows:

Accessory Equipment Departm Bridgeport, assigned to Compo Products Division, with headquar in Fort Wayne, Indiana.

Conduit Products Departm Bridgeport, assigned to the Chen and Metallurgical Division, P field, Mass. The department also erates a plant at New Kensing Pa.

Wire and Cable Departm Bridgeport, with plants at Lo Mass., and Oakland, Calif., signed to Chemical and Metallur Division.

Wiring Device Department, P idence, R. I., assigned to Chen and Metallurgical Division. This partment also has facilities at Bri port and Norfolk, Conn., and N port, R.I.

Sales Department, Bridgeport lations and Utilities Department, Legal Department assigned to Ch ical and Metallurgical Division.

Departments of the Measurem and Industrial Products Division be assigned as follows:

Industrial Heating Departm Shelbyville, Ind., to Motor and erator Division, Erie, Pa.

Meter Department, Somersw N. H., assigned to Transformer vision, Pittsfield.

Instrument Department, Lynn, Mass., assigned to Indus Electronics Division, New York, cept for instrument transform whose manufacture is assigne the Meter Department.

Outdoor Lighting Departm Hendersonville, N. C., assigne Lamp Division, Cleveland.

In addition, the Industry Co Department, Roanoke, Va., wil reassigned from the Switchgear Control Division, Philadelphia, t Industrial Electronics Division, Paxton said.

w Au omatic Dispatching Syste n Developed by \ /estinghouse

key f ıture of a new automatic ching system developed by gear ngineers of the Westing- Elect ic Corporation is the in- ion o economics into the con- f sys m generation to match

w the ries and techniques were ped nd Westinghouse engi- are p esently building a simu- syste 1 to test the principles in- l. Act ıal dispatching equipment e used with simulated inputs to uipm nt, and the output fed to ulated power system.

r example, a feature of the test ment is a device that simulated ily load curve of an electric util- ence, problems of changes in load nd, variable in both amplitude requency, can be introduced into spatching equipment under test. dispatching equipment feeds its l signals to equipment that rep- s the system's generators, so that acy and stability of dispatch con- ystem can be demonstrated.

ese laboratory tests on the new tching equipment are being run rallel with analytical studies to the new automatic dispatching n, both analytically and em- lly.

Releases New Metal-clad Switchgear Bulletin

STR CTION and design fea- of A lis-Chalmers 4.16-kv hori- l dra out metal-clad switchgear "Ru air" circuit breaker are de- d in a new bulletin released by mpa y.

e sw chgear features complete sure all live parts, segregation rcuit and all grounded metal rs f maximum safety. It pro- mu ipl interlocking, a uni- ly a ptable cable compartment, easy reaker insertion, "Pyro- d" in ation, automatic, positive- shu rs, trunnion-mounted po- l tr sformers, and accessible nt tr sformers.

eatu of the outdoor switchgear 75-i 1 wide service aisle inside ther rotected enclosure and its ilhou te. The indoor switch- s onl 72 inches high. Buswork witchgear components are ar- d to rovide maximum flexibil- r the addition of future switch- nits.

Copies of "Horizontal Drawout Metal-Clad Switchgear," 18B6346C, are available on request from Allis-Chalmers Mfg. Co., Milwaukee 1, Wisconsin.

Kuhlman Electric Offers New Series—Multiple Switch

A NEW series-multiple switch offered by Kuhlman Electric Company of Birmingham, Michigan, allows increase of system voltage without changing transformers. Pole-type transformers from 5 to 167KVA, equipped with the externally mounted switch can be installed at a given line voltage and uprated later, when the distribution voltage is raised.

Operation of the new Kuhlman switch is simple and safe. The specially designed cap, when removed and reversed, becomes the tool by which the switch mechanism is rotated.

First position of the switch is a multiple connection. The second position, for higher voltage changeover, is a series connection.

Each contact in the Kuhlman switch is individually spring loaded and independently applies pressure against the contact bar of the moving member. Positive contact is assured by this construction.

The switch is fastened directly to the tank wall. It is operated by direct drive, eliminating flexible connections and the possibility of misalignment.

The series multiple-switch is available on Kuhlman pole-type transformers in 5 to 167KVA standard ratings.

Sulfur Hexafluoride for 15,000-MVA Circuit Breaker

THE first 230-kv, 15,000-mva sulfur hexafluoride circuit breaker designed and built by the Westinghouse Electric Corporation will be installed on the Pennsylvania Power and Light Company's system in mid-1960.

The unusual arc-interrupting ability of sulfur hexafluoride gas has made it possible to design a large high-voltage, high-power circuit breaker that combines the best features of insulating oil and compressed air designs. From oil breaker designs, the new breaker has borrowed dead-tank construction, positive mechanical connection between all contacts and operating mechanisms, and bushing-type current transformers.

Like air breakers, the SF6 breaker has lightweight, low-impact loading of foundations, and consequently light foundation requirements. Since the unit is self-contained and does not exhaust to atmosphere, the breaker does not make the noise of an air breaker. Also, the auxiliary apparatus normally required with air breakers has been held to a minimum.

Basically, each pole of the breaker consists of a round horizontal tank, with a bushing rising vertically from each end, and the interrupter mounted axially within the tank between bushings. Minimum dimensions are made possible by the high dielectric properties of sulfur hexafluoride. The gas readily recombines after arc extinction, resulting in negligible gas decomposition and extending time between maintenance periods.

Being a ground-level tank, platforms are not required during installation and service work on the breaker. The interrupter consists of multiple-break contacts tied together mechanically to a single operator, assuring simultaneous making and breaking of contacts.

New Yarway Bulletin on Unit Tandem Blow-off Valves

NEW Bulletin B-435, Supplement A, put out by Yarnall-Waring Co., Philadelphia 18, Pa., describes new Yarway Unit Tandem Blow-Off Valves for boiler blow-off pressures to 665 psi, basic pressure rating 400 psi.

Contains full description, operating details, materials, dimensions, advantages, etc.

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by Francis X. Welch, B. Litt., LL. B., LL. M.

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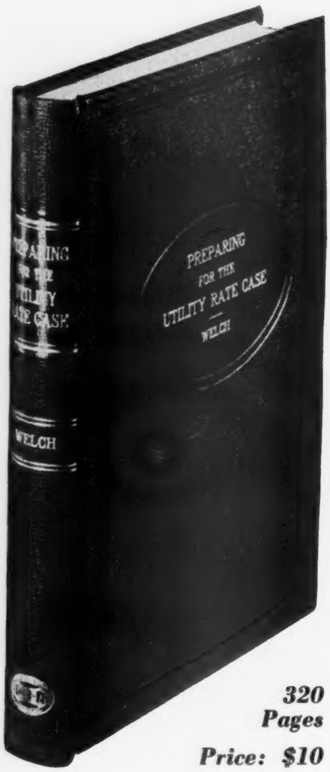

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- **aiding the consumer by making possible faster plant and service improvements**
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